PARTIAL CLOSURE PLAN

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PPG INDUSTRIES, INC. CIRCLEVILLE OHIO

OFFICE OF RCRA WASTE MANAGEMENT DIV EPA, REGION V

**Prepared For:** 

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

June 1993

Prepared By:

ICF KAISER ENGINEERS, INC. Four Gateway Center Pittsburgh, Pennsylvania 15222

> ICF KAISER ENGINEERS

Four Gateway Center, Pittsburgh, Pennsylvania 15222

Partial Closure Plan 04512-08-C

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#### PREFACE

This Partial Closure Plan is designed to close four interim status hazardous waste management units in a manner that 1) minimizes the need for further maintenance, and 2) controls, minimizes, or eliminates (to the extent necessary to protect human health and the environment) post-closure escape of hazardous wastes, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface water, or to the atmosphere in accordance with the following applicable federal and state regulations:

Federal:

40 CFR Subpart G, Sections 265.110-115,

265.140-143, 265.147, 265.197 and 265.351

State:

OAC 3745-66-10 through 20

OAC 3745-66-40 through 47

OAC 3745-66-98 OAC 3745-68-51

This revision of the Partial Closure Plan incorporates the responses to all issues identified by Ohio EPA since submittal of the January 14, 1991 Plan. PPG had responded to Ohio EPA's comments in a written, itemized response format with the understanding that once concurrence was reached on all issues identified by Ohio EPA, the January 1991 Partial Closure Plan would be revised to reflect the resolved issues.

This Partial Closure Plan outlines closure procedures that were performed for the liquid waste incinerator and three drum storage areas at the PPG Circleville resin plant. This plan documents the results of the work completed through the end of 1992, as well as incorporates responses to OEPA comments in 1993 and provides risk assessment criteria to demonstrate the remaining low level residuals do not pose a threat to human health or the environment.

Since this plan is written to describe activities already performed, appropriate documentation such as analytical results for the work performed is attached.

The schedule for past work is presented with actual calendar dates to document when the work was performed. It should be noted that the overall facility closure plan, which included a partial closure plan for the liquid waste incinerator and three drum storage pads, was approved by both Ohio EPA and U.S. EPA in November 1987. All work performed to date has been in accordance with the original approved plan and continuing correspondence with OEPA.

The partial closure of the liquid waste incinerator and drum storage areas began in April of 1989 after notice from the U.S. EPA and Ohio EPA that trial burn results for the Energy Recovery Unit (ERU) were satisfactory. These areas were permitted as storage and treatment locations under

RCRA Interim Status, but will not be retained under Final Permit Status. Figure 6.1 provides a bar chart schedule for partial closure activities performed from April through November, 1989. The Ohio EPA's facility inspector was contacted in advance of crucial closure activities, such as decontamination, soil sampling or removal. The actual dates when the Ohio EPA inspector was on site are documented on the schedule. Section 6.0 of this plan also summarizes key activities that have occurred since November, 1989.

Within 60 days of completing closure activities, PPG will submit the appropriate documentation that closure has been completed in accordance with the approved closure plan (i.e., soil sample analysis results, closure certification statements). The certification by the independent professional engineer and PPG will be in accordance with OAC Rules 3745-50-42, 3745-50-42(D), and 3745-66-15, respectively.

# 1. DESCRIPTION OF FACILITY

PPG Industries, Inc., Coatings and Resins Group, owns and operates a manufacturing plant south of Circleville, Ohio in Pickaway County as shown on the site location map (Figure 3.1). The surrounding area is classified as industrial and agricultural. The nearest residential development is approximately one-half mile from the plant boundary. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat.

The facility was originally constructed in 1962. The plant produces resins that are used in the manufacturing of paint and coating products at other PPG divisional manufacturing facilities located throughout the world. During the production of resins and paints, wastes are generated from the cleaning of process equipment, filtering of products, byproducts of reactions, and unusable finished products or raw materials.

The Circleville facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The former locations of the Liquid Waste Incinerator and the West Pad, South Pad, and Still Pad drum storage areas are indicated in Figure 3.2. Wastes from the Circleville facility possess the hazardous characteristics of ignitability, corrosivity, reactivity and/or toxicity characteristic. The incineration process destroyed the ignitable, corrosive, reactive, and organic toxicity properties of the wastes. The incinerator operated for approximately seventeen years (1971-1988) and the drum storage pads were used for periods of five to twenty-four years. The EPA Facility Identification Number for the PPG Circleville Plant is OHD004304689.

In 1987, the Energy Recovery Unit (ERU) began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants throughout North America and processes them for thermal treatment by incineration. The wastes are reduced to a small fraction of their original volume, and the energy value of the waste is recovered in the form of steam to help meet the total energy requirements of the manufacturing plant.

Following the startup and operation of the ERU and the Circleville facility, five hazardous waste storage tanks were kept in service at the resin plant. The former liquid waste incinerator and three drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in this Partial Closure Plan.

The following sections present the Partial Closure Plan for the four interim status hazardous waste management units which were closed in 1989 at the PPG Circleville site. This Partial Closure Plan presents a clean closure of the Still pad and risk assessment demonstration of clean closure of the Former Liquid Waste Incinerator, the West Drum Storage Pad, and the South Drum Storage Pad.

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# 2. DESCRIPTION OF WASTE MANAGEMENT UNITS CLOSED UNDER PARTIAL CLOSURE

The units closed in 1989 were the Liquid Waste Incinerator, the West Storage Pad, the South Pad and the Still Pad. Closure activities included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

The following descriptions of the closure units are based in part on information contained in the RCRA Interim Status permit.

**2.1 Liquid Waste Incinerator** -- (refer to Figure 4.1 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a liquid waste incinerator with three (3) lances (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. Other components of the unit included a breech, containing a temperature recorder that controlled the waste feed pumps, and a discharge stack, containing a quench water system. The incinerator had been in use since 1971. Ancillary equipment to the incinerator consisted of three (3) waste lines that fed directly into the lances and a blower that added combustion air and created air turbulence in the incinerator hearth. The incinerator area also included a concrete containment area located southeast of the incinerator pad. The topography of the area is flat. Wastes treated in the incinerator included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or
	dissolved in one or more of the following solvents: xylene,
	ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

D001 -	Aqueous Decanter Waste (aqueous phase byproduct from resin
D002	manufacturing process, containing VOCs and organic acids)
D035	

F003 - Still sludge including xylene, ethylbenzene and methyl isobutyl ketone

F005 - Still sludge including toluene and methyl ethyl ketone

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

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**2.2 Waste Drum Storage Area, Still Pad** -- (refer to Figure 4.2 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a concrete pad, approximately 80' x 100', on which waste drums were stored. The pad had been in use since 1965. The area is flat. Wastes stored on the pad included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or
	dissolved in one or more of the following solvents: xylene,
	ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl
	ethyl ketone)

F002 - Spent methylene chloride

F003 - Incinerator brick and residue generated by the incineration of F003 wastes

F005 - Incinerator brick and residue generated by the incineration of F005 wastes

U009 - Waste acrylonitrile

U223 - Waste toluene diisocyanate

Drums containing lab packs

2.3 Waste Drum Storage Area, West Pad -- (refer to Figure 4.3 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10'x100'. This unit was in use from 1975-1985. Waste stored in this area included the following:

- D001 Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
- F002 Spent methylene chloride

2.4 Drum Storage Area, South Pad -- (refer to Figure 4.4 for a detailed drawing of this hazardous waste management unit)

This unit consisted of a flat, packed gravel area approximately 90'x240'. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

# 3. MAPS OF FACILITY

This Section contains two facility maps as required by OEPA Closure Plan Review Guidance. These two figures locate the facility units which were closed within the site property boundaries, located in Pickaway County.

Figure 3.1 is the Facility Location Map and Figure 3.2 depicts the Interim Status Hazardous Waste Management Unit Locations, highlighting the closed units. The scales on these figures are noted.

Figure 3.1 - Facility Location Map

Figure 3.2 - Interim Status Hazardous Waste Management Unit Locations

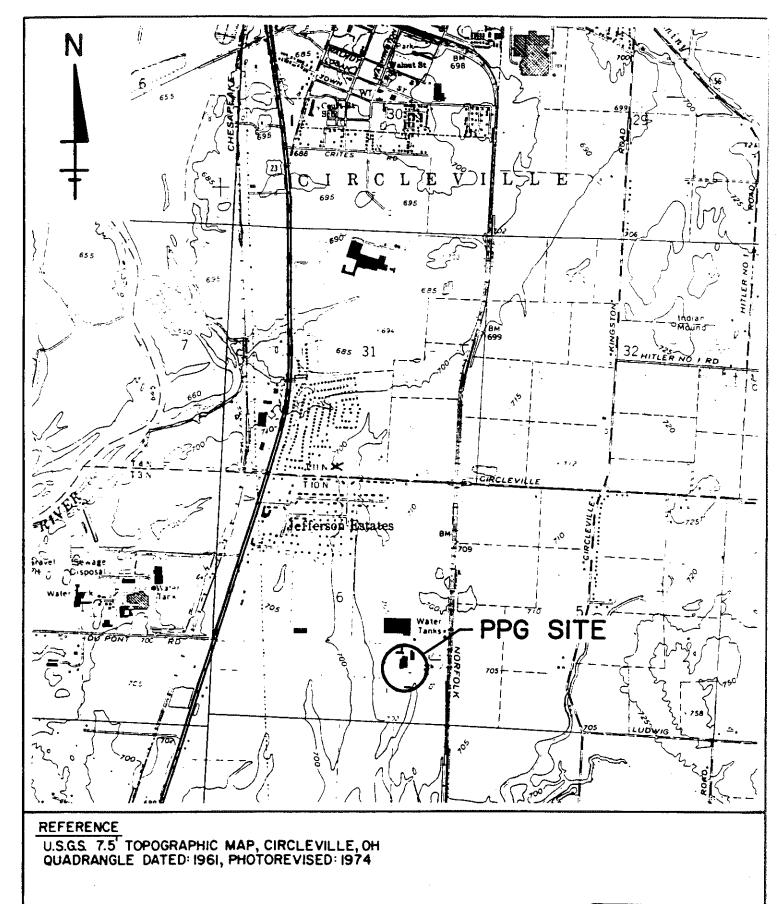
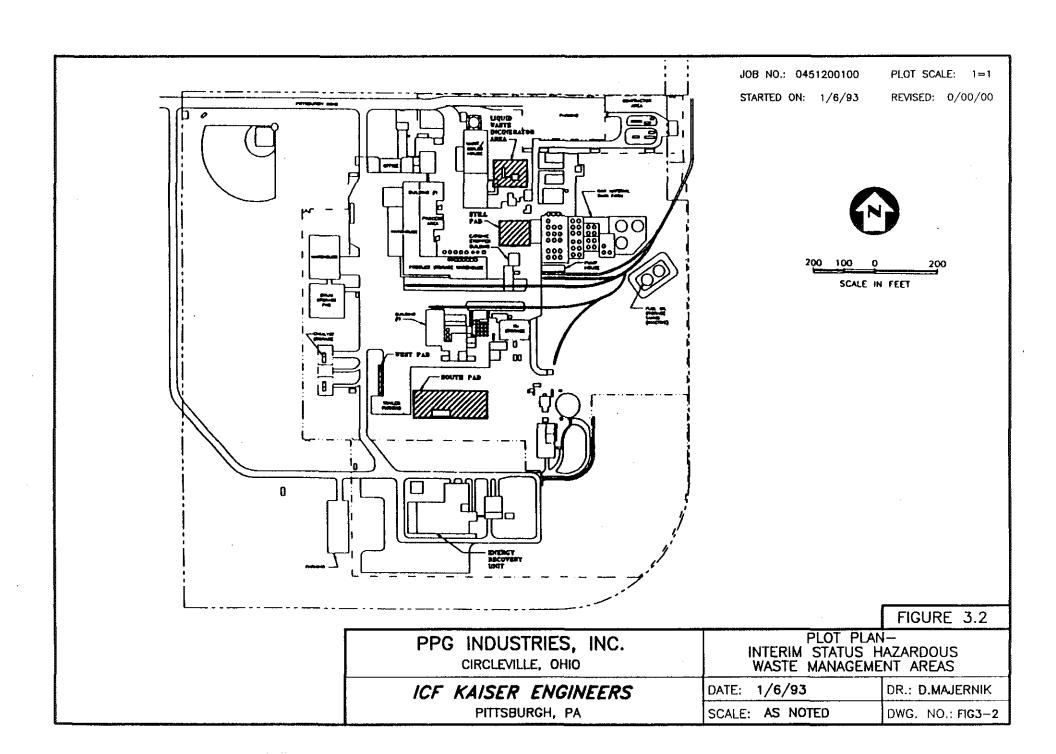


		FIGURE 3.1	
PPG INDUSTRIES INC. CIRCLEVILLE, OHIO	SITE LOCA	TION MAP	
ICF KAISER ENGINEERS	DATE: AUG. 21, 1992	DR.: D. BRENT	
PITTSBURGH , PA.	SCALE:  " = 2000'	DWG. NO.: 04830	



# 4. DETAILED DRAWINGS OF UNITS TO BE CLOSED

This Section contains the detailed figures of the closed units as specified by OEPA Closure Plan Review Guidance. The figures are labeled as follows:

Figure 4.1 - Liquid Waste Incinerator

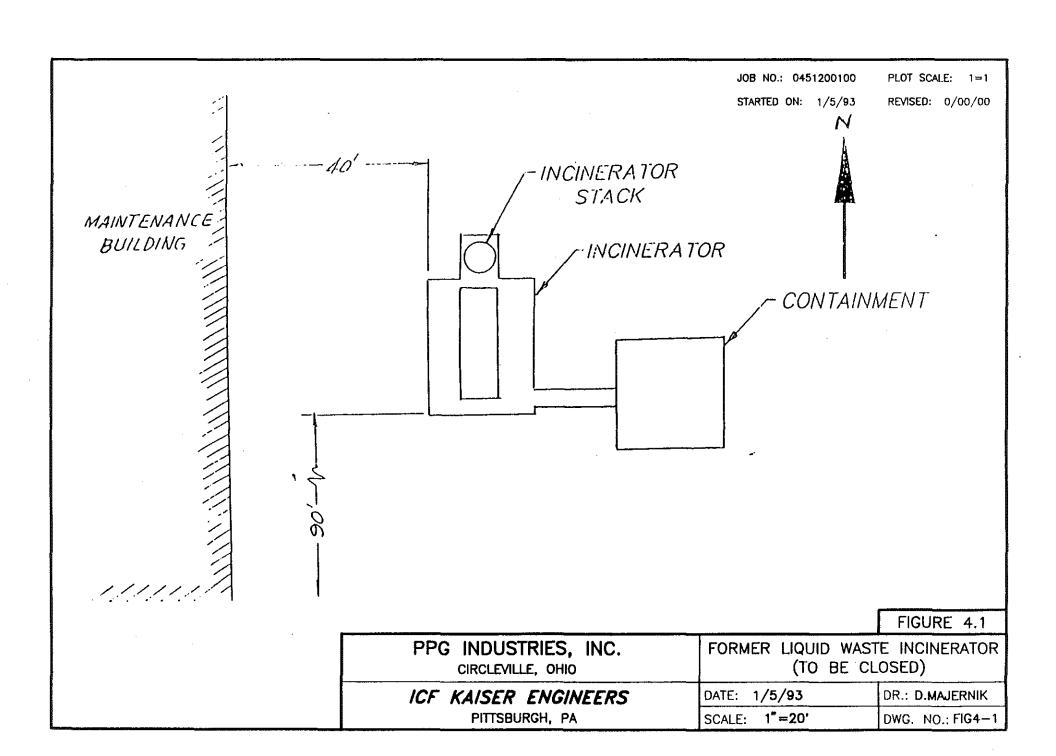
Figure 4.2 - Waste Drum Storage - Still Pad

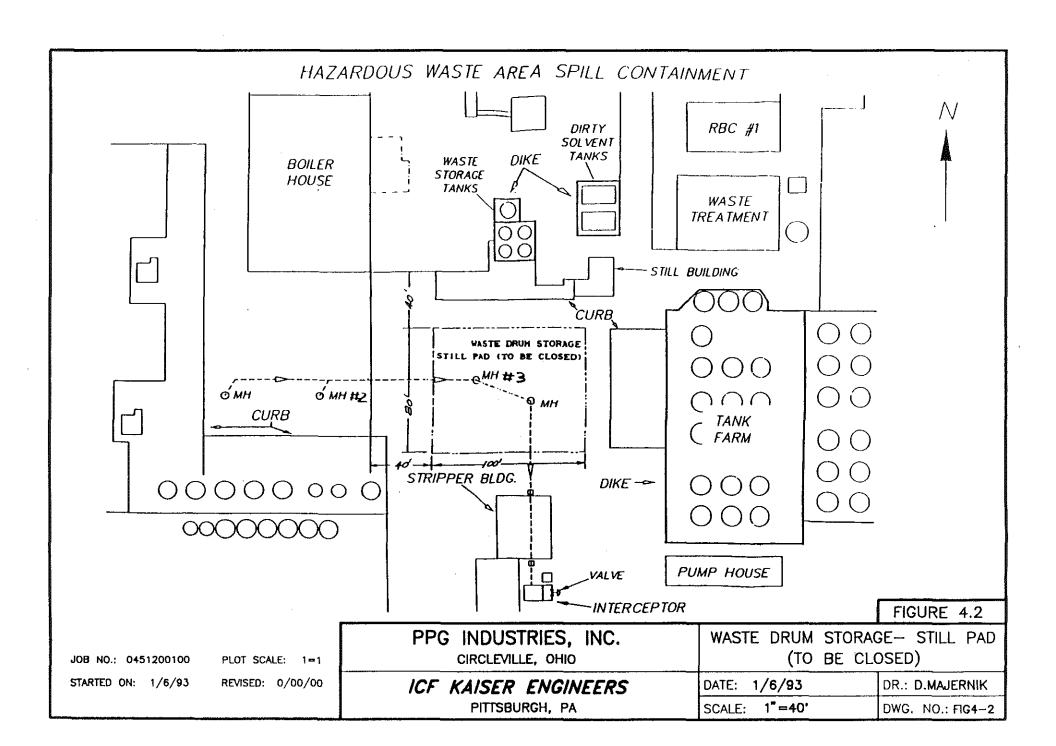
Figure 4.3 - Waste Drum Storage - West Pad

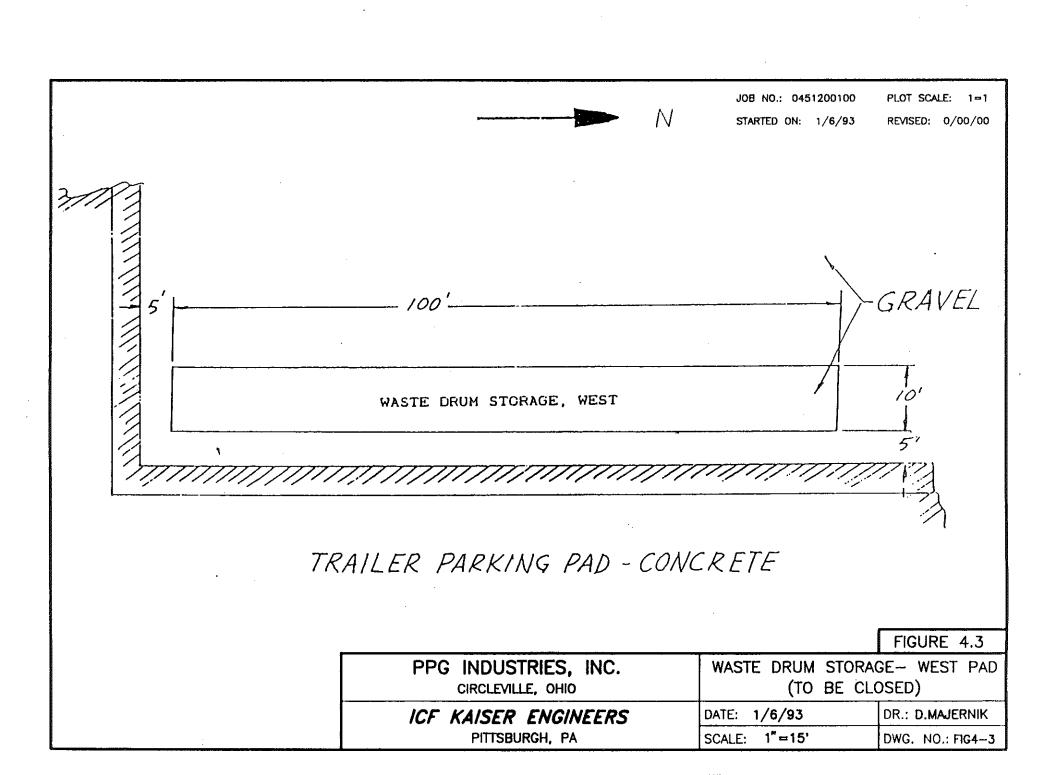
Figure 4.4 - Waste Drum Storage - South Pad

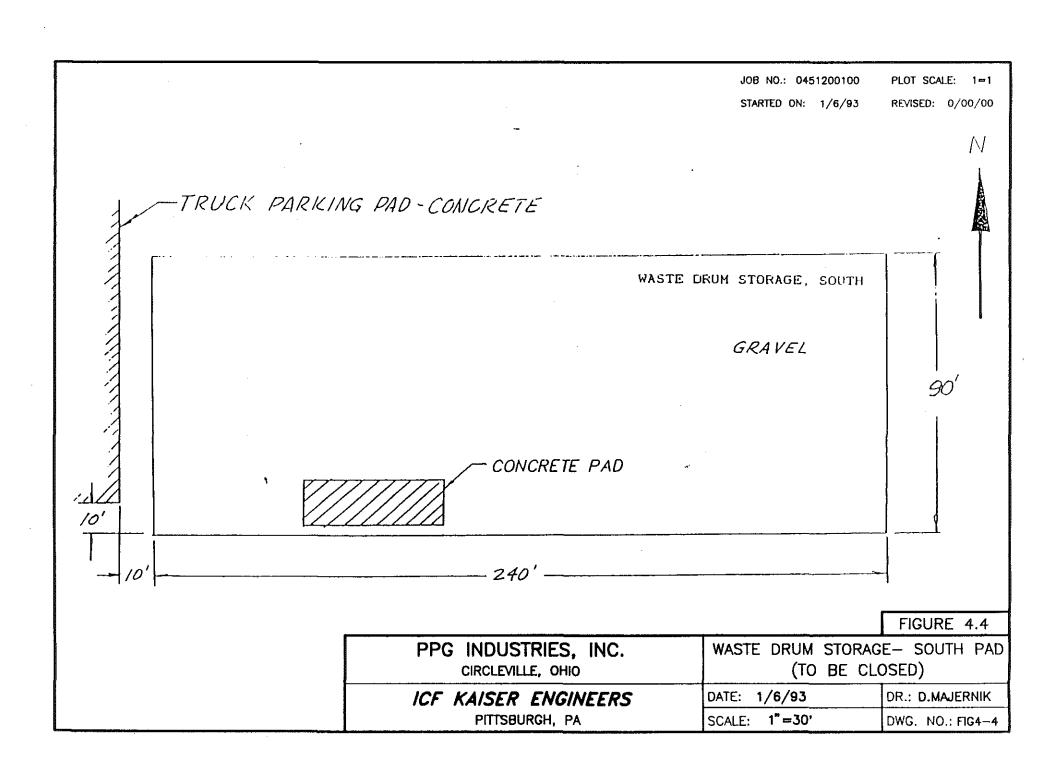
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### 5. LIST OF HAZARDOUS WASTES

A complete list of hazardous wastes and Appendix VIII hazardous constituents stored and/or treated at the waste management units closed under this Partial Closure Plan follows. This list also includes an estimate of the maximum inventory of waste in storage or treatment.

#### 5.1 Liquid Waste Incinerator

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or
	dissolved in one or more of the following solvents: xylene,
	ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl
	ethyl ketone)

D001 -	Aqueous Decanter Waste (aqueous phase byproduct from resin
D002	manufacturing process containing VOCs and organic acids)
D035	<u> </u>

Still sludge including xylene, ethylbenzene, and methyl isobutyl ketone F003 -

F005 -Still sludge including toluene and methyl ethyl ketone

Maximum Incinerator Capacity - 5.5 tons/hour

#### 5.2 Waste Drum Storage Area -- Still Pad

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or
	dissolved in one or more of the following solvents: xylene,
	ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl
	ethyl ketone)

F002 -Spent methylene chloride

F003 -Incinerator brick and residue generated by the incineration of F003 wastes

F005 -Incinerator brick and residue generated by the incineration of F005 wastes

Waste acrylonitrile U009 -

U223 -Waste toluene diisocyanate

Drums containing lab packs

Maximum Inventory - 1000 drums

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# 5.3 Waste Drums Storage Area -- West Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or

dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl

ethyl ketone)

F002 Spent Methylene Chloride

Maximum Inventory - 200 drums

# 5.4 Waste Drum Storage -- South Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or

dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl

ethyl ketone)

Maximum Inventory - 1500 drums

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol managed at the facility was only associated with the Waste Resin Material (D001).

# 6. SCHEDULE FOR CLOSURE

Partial closure of the interim status hazardous waste management units at the site consisted of the following:

- Decontamination of Liquid Waste Incinerator equipment.
- Decontamination of the Still Pad concrete.
- Rinseate sampling and analysis to confirm successful decontamination of the incinerator equipment and Still Pad concrete, and to determine rinseate disposal requirements.
- Disposal of incinerator equipment.
- Removal and disposal of various concrete pads.
- Soil sampling and analysis to confirm that the remaining soils in the areas of the waste management units meet clean closure requirements.

Figure 6.1 shows the schedule in bar chart form, indicating the field activities that were performed during the time period April 1989 through November 1989. Since November of 1989, the following significant activities have occurred as the result of the continuing dialogue between PPG and Ohio EPA:

<u>Date</u>	Activity
05/11/90	PPG submits revised Partial Closure Plan.
07/25/90	Attorney General's office responds to resubmitted Plan. OEPA wants the Partial Closure Plan to reflect the work that has already been complete and for PPG to decide whether each unit will be clean closed or closed based on a risk assessment demonstration of clean closure.
01/14/91	PPG submits revised Partial Closure Plan that includes work completed to date and a risk assessment demonstration for clean closure of the South Drum Storage Pad, West Drum Storage Pad, and Former Liquid Incinerator area.
05/01/91	OEPA issues new closure guidance document.
06/28/91	OEPA provides comments on January 1991 Partial Closure Plan.
09/13/91	PPG submits response to OEPA issues raised in June 28, 1991 letter.

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11/22/91	OEPA responds to 9/13/91 submittal by PPG.
11/26/91	PPG meets with OEPA to discuss each point in OEPA's November 22, 1991 letter.
01/03/92	Letter dated December 31, 1991 from OEPA which summarizes the status of negotiations based on the 11/26/91 meeting is transmitted to PPG. This OEPA letter summarized issues yet to be resolved.
04/14/92	PPG provides written response to OEPA's letter of 12/31/91. PPG's response includes documentation that PCB levels in the sampling results are unrelated to RCRA activities and that no additional sampling is necessary to define the extent of past releases.
05/08/92	Representatives of OEPA visit plant to look at areas covered by the Partial Closure Plan.
06/01/92	OEPA comments in writing on PPG's response of 4/14/92. OEPA accepts PPG's documentation that PCBs found as a result of closure sampling activities are unrelated to RCRA activities. OEPA requires that the full extent of contamination must be defined.
07/27/92	PPG responds in writing to OEPA's letter of 6/1/92. PPG proposes to perform additional soil sampling to move negotiations forward.
08/04/92	OEPA conducts site visit of plant.
08/07/92	PPG responds in writing to OEPA's site visit and proposes to take an additional sample from the former liquid incinerator area.
08/31/92	OEPA accepts the additional sampling proposed in PPG's letters of 7/27/92 and 8/7/92.
09/23/92	ICF Kaiser Engineers conducts additional sampling.
10/07/92 10/13/92	Hearing date is set for February 8, 1993.

10/31/92	ICF Kaiser Engineers re-samples grids where samples from 9/23/92 exceeded their holding time for analysis.
12/11/92	PPG submits results of additional sampling program to OEPA.
01/08/93	PPG submits revised Partial Closure Plan to reflect all resolved issues.
01/19/93	OEPA Central Office comments on the revised Partial Closure Plan dated January 7, 1993.
01/21/93	OEPA Central District Office comments on the revised Partial Closure Plan dated January 7, 1993.
01/29/93	PPG responds in writing to OEPA's comments of 1/19/93 and 1/21/93.
02/02/93	Hearing Examiner, counsel for PPG, and counsel for OEPA staff participate in a telephone conference call in which counsel represented that the parties had reached a settlement agreement. Additional time was requested to prepare a settlement agreement.
02/05/93	Attorney General's office responds to PPG response of 1/29/93. OEPA accepts PPG responses and requires that the Partial Closure Plan address all necessary sampling to define the vertical extent of contamiantion or provide for amending the Closure Plan to address closure in place.
02/08/93	Hearing Examiner orders filing of Settlement Agreement on or before March 1, 1993.
02/19/93	PPG submits revised Partial Closure Plan to incorporate comments in the letter dated 2/5/93 from the Attorney General's office.
03/08/93	Settlement agreement reached between PPG and OEPA.
03/08/93	Revised Partial Closure Plan made available for public comment through 04/14/93

03/24/93	ICF Kaiser Engineers performs additional soil sampling to define vertical extent of contamination and to determine leaching potential of constituents to groundwater using TCLP procedure.
04/02/93	PPG submits letter to OEPA correcting Grid Number 71 to 76.
05/05/93	Hearing Examiner issues Report and Recommendations.
06/11/93	OEPA Director issues letter approving amended Closure Plan to PPG (Received 6/14/93).

The only remaining schedule item is final certification by an independent registered Professional Engineer and PPG which will perform after acceptance of this revised plan by the Agency.

JOB NO.: 0451200100

PLOT SCALE: 1=1

STARTED ON: 1/5/93

REVISED: 0/00/00

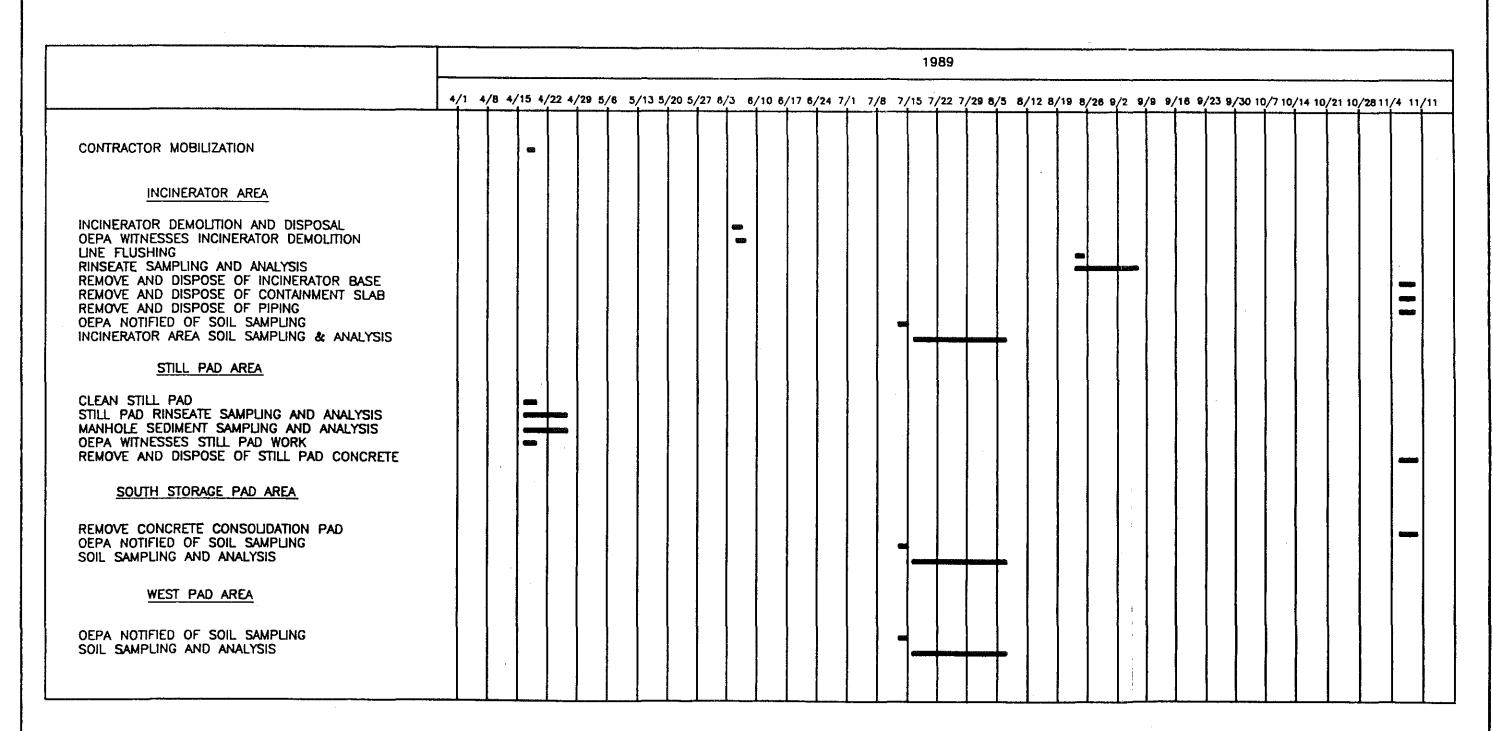


		FIGURE 6.1
PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	PROJECT : 1989 PARTIAL CL	SCHEDULE OSURE ACTIVITIES
ICF KAISER ENGINEERS	DATE: 1/5/93	DR.: D.MAJERNIK
PITTSBURGH, PA	SCALE: NONE	DWG. NO. TIMELINE.DWG

# 7. AIR EMISSIONS

Appropriate engineering controls were used during the partial closure activities to minimize odors and dust emissions. Water spray was used as necessary to control fugitive dust emissions during incinerator decommissioning. Overspray from high pressure washing of the Still Pad was controlled by carefully directing the spray towards the center of the containment area and by plastic wrapped plywood barriers when working near the pad edges.

#### 8. PERSONNEL SAFETY AND FIRE PREVENTION

All\_Partial Closure Work was performed in Level D protection. The personnel protective equipment consisted of coveralls, gloves, steel-toed boots, eye protection and hard hats. This level of protection provided adequate dermal and respiratory protection from the substances present in the closure areas and the work activities performed. Dust respirators (Level C respiratory protection) were used whenever personnel entered the incinerator or whenever conditions required them.

PPG plant safety rules were followed by clean-up and sampling personnel at all times during closure activities. These rules are attached as Attachment D. These safety rules address possible hazards to workers present at the plant, and describe specific fire prevention measures. Areas undergoing closure were isolated with yellow caution tape to limit access.

To prevent the spread of contamination during the 1989 closure activities, the following procedures were followed:

Prior to leaving the decontamination area, the coveralls were removed and discarded; residues from the boots or other outer protective clothing were scraped or rinsed. Personnel undergoing decontamination stood in containment areas to catch all rinseate and residues resulting from decontamination activities.

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#### 9. DECONTAMINATION EFFORTS

An independent registered Professional Engineer has certified that appropriate methods were used and that a minimum amount of residue remains based on the activities performed in 1989. The risk assessment as described in Section 10 of this Closure Plan confirms that the remaining residues do not present an unacceptable risk to human health. The results of analytical tests on the rinseates generated during decontamination efforts are included in Attachments A and B. Attachment A includes the results of all analyses performed during the closure under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds. Additional soil sampling performed in 1992 at three of the interim status hazardous waste management units is described in Section 11.0 and the results included in Attachment C. Minor sampling was conducted in March, 1993 to define the vertical extent of contamination at two of the units. Samples were also collected during this event to determine the leachability of constituents of concern from soil to groundwater.

#### 9.1 Incinerator

After shutdown and cooldown, all residue in the incinerator hearth, breech and stack were removed and put into drums. It was evident that decontamination was not feasible, due to difficulty in removing refractory material from metal parts. The incinerator hearth, breeching, stack, refractory, and ancillary equipment were dismantled and loaded into roll-off boxes or dump trailers and transported to Adams Center Landfill, a RCRA permitted secure landfill, located in Fort Wayne, Indiana. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of this analysis are also included in Attachment B.

#### 9.2 **Incinerator Organic Waste Feed Lines**

There were two (2) organic waste feed lines, each of which was approximately 120 feet long and 1-1/2 inches in diameter.

These lines were cleaned of organic residue by repeatedly flushing them with fifty gallons of cleaning solvent (the same solvent used by PPG to clean production equipment). The cleaning solvent was analyzed for percent total solids before and after each flush. When the "before" and "after" percent solids analysis of the cleaning solvent were within 0.5 percent of each other, solvent cleaning ceased. The spent solvent was sent to the on-site permitted hazardous waste incineration facility (ERU).

Partial Closure Plan Revision: 3 9-1 Date: June 24, 1993 Following the solvent cleaning the lines were flushed three times with water to remove residual solvent. This water also was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the pipe as a hazardous waste rather than attempt further decontamination.

The cleaned pipe was then taken down, cut into sections, and visually inspected for hardened residues. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

# 9.3 Incinerator Aqueous Waste Feed Line

The aqueous waste feed line was about 100 feet long and one (1) inch in diameter.

The aqueous waste feed line was flushed three times with deionized water. The flushing water was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the feed line as a hazardous waste rather than attempt further decontamination.

Once cleaned, the line was taken down, cut into sections, and inspected. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

# 9.4 Incinerator Base, Spill Containment Pad and Drum Storage Pad (Still Pad)

After the incinerator equipment and residues were placed in secure containers as previously described, the incinerator base, spill containment pad and adjacent drum storage area were swept to remove any loose debris.

These areas then were scraped to remove any visible residues. All residues removed from the concrete surface were placed into DOT-approved 17-H drums.

No further cleaning was performed on the incinerator base and containment pad. These were removed and disposed of as a hazardous waste in the Adams Center Landfill. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

The Still Pad was decontaminated with high pressure water. Rinseate was contained inside a foam dike which was installed at the perimeter. The dike material was used to provide a leak-proof containment area. During cleaning operations, all rinseate was collected using drum vacuums. The recovered water was transferred to DOT-approved 17-E drums. The final rinse was collected, placed

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into drums, and a composite sample collected using glass coliwassa tubes. The rinseate was analyzed for the entire Hazardous Substance List including the following F002, F003, and F005 substances:

Xylene
Ethylbenzene
Methyl Isobutyl Ketone
Methanol
Toluene
Methyl Ethyl Ketone
Methylene Chloride

The rinseate samples from this area were also analyzed for PCBs (polychlorinated biphenyls) and acrylonitrile. Toluene diisocyanate, also stored here, was not included in this analysis. This substance is reactive with water and cannot be quantified by standard analytical methods.

Of the above substances, only methylene chloride was found above detectable limits (169 parts per billion) in the final rinseate. Since no MCL or MCLG exists for methylene chloride, 1 mg/L is the clean standard for the rinseate. A library search for tentatively identified compounds also detected 84.1 mg/L of Butyl Cellosolve. This contaminant was most likely a result of using reconditioned 17-E Drums for rinseate collection. However, this compound is not a hazardous constituent as defined in 40 CFR Part 261. On this basis, the Still Pad was considered clean. All rinseate and foam dike material was incinerated on-site at the ERU.

As described in Section 12, the Still Pad was removed as part of PPG's East Yard PCB Remediation and Spill Containment Project. All concrete within the Still Pad area was removed and disposed of as a hazardous waste at the Adams Center Landfill. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of these analyses are included in Attachment B. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

#### 10. CLEAN LEVELS FOR SOILS

#### 10.1 Introduction

In order to demonstrate the clean closure of the Former Liquid Waste Incinerator, West Drum Storage Pad and the South Drum Storage Pad, a risk assessment was performed to determine whether or not a threat to human health exists in association with the residual chemicals originating in these three units. The risk assessment was conducted in accordance with the approaches and design required by OEPA's "Closure Plan Guidance Manual" (1991; with errata sheets), despite the fact that these approaches do not reflect anticipated site situations. This section is a brief summary of the supporting risk assessment for this partial closure. Details of the information presented here may be found in the risk assessment document included as Attachment E.

# 10.2 Background

The risk assessment was conducted in a manner consistent with the original National Academy of Sciences approach (1983), which recommends the four steps as follows: hazard identification (identification of chemicals of concern), which includes organization of unit investigation data and identification of chemicals of concern; dose-response assessment (toxicity assessment), which involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern; exposure assessment, which consists of identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and risk characterization, which is a description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action. Each step is addressed in greater detail below.

#### 10.3 Chemical Selection

OEPA requires that every chemical attributable to and detected in each unit be incorporated into the risk assessment. In addition, the highest concentration of each detected chemical must also be included in the risk assessment for each unit. The applicable detected chemicals for each unit are presented in Table 10.1. These chemicals and the maximum concentrations were incorporated into the subsequent steps of the risk assessment.

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# 10.4 PCB Exclusion

Polychlorinated biphenyls (PCBs) were detected in some of the soil samples collected from beneath the South Pad and Former Liquid Waste Incinerator areas; however, the presence of PCBs in these areas is not related to RCRA waste management activities and thus, PCBs were not included in the list of compounds addressed by the risk assessment. Attachment F presents PPG's documentation and certification that PCB levels recorded were not related to RCRA activities. This documentation was previously submitted to OEPA on April 14, 1992 and accepted by OEPA in their letter dated June 1, 1992.

Extensive PCB remediation has been conducted at the site by PPG. This remediation began in April of 1988 as a result of finding PCB contamination in the plant storm sewers. The source of this contamination was the hot oil Therminol System. Remediation followed the guidelines of the PCB Spill Cleanup Policy and applicable TSCA (Toxic Substances Control Act) requirements. The "action" level for soils tested as part of this remediation is 25 ppm as set forth in the cleanup policy for restricted area locations.

The storm sewer, including manholes in the Still Pad area, were included in the Phase III East Yard remediation project. Compounds present in the two open manholes in the Still Pad Area were clearly from sources other than the waste stored on the Still Pad Area. During remediation of the East Yard Area, PCB and VOC analysis were completed upstream, e.g., Manhole #2, of the Still Pad and showed elevated levels of PCBs and VOCs. Considering the source of PCB's (Therminol pump area) and VOC's (bulk product loading) it is clear these compounds were not related to hazardous waste storage at the Still Pad. These manholes were completely removed and replaced along with the rest of the contaminated storm sewers. All surface concrete in the East Yard area was also removed and replaced. A final report detailing remediation activities and sampling was submitted to OEPA in February 1990 and titled "East Yard Remediation, PPG Industries, February 1990, Project Number 88727". This contamination was and is being addressed by the Administrative Order of Consent signed between PPG and OEPA dated December 1989.

# 10.5 Dose-Response Assessment

To identify dose standards (benchmark values) for each of these chemicals, the USEPA Health Effects Summary Tables (HEAST) and Integrated Risk Information System (IRIS) were accessed and the information was incorporated into the risk assessment. Table 10.2 presents the benchmark values for each chemical of concern.

# 10.6 Exposure Assessment

OEPA requires a future unrestricted land use scenario for RCRA closure risk assessments. This scenario was incorporated into this risk assessment, for both an adult and a child, using factors as required in the OEPA "Closure Plan Guidance Manual". The exposure pathways required by OEPA were evaluated quantitatively, as follows: ingestion of chemicals in soil, dermal contact with chemicals in soil, inhalation of chemicals associated with unit-originated airborne particulate matter, ingestion of chemicals in water, inhalation of chemicals volatilizing during showering, dermal contact with chemicals in water, and inhalation of chemical volatilizing from soil. Where specific approaches were not identified by OEPA, appropriate calculations were incorporated, complete with explanations of factors, equations and full literature citations.

To document that there is no potential for constituent migration to groundwater, a total of four soil samples were collected at a depth of 6"-12" below ground surface at Grid Location Numbers 24 and 45 at the Former Liquid Waste Incinerator and Grid Location Numbers 76 and 100 at the South Drum Storage Area and subjected to the TCLP leaching procedure. TCLP leachates produced were analyzed for volatile organic constituents of concern (ethylbenzene, toluene, xylene and methylene chloride) using EPA SW 846 Method 8240. None of these constituents were detected in the TCLP samples; therefore, groundwater exposure pathways do not require consideration in the risk assessment.

#### 10.7 Risk Characterization

The results of the risk assessment are presented in the risk characterization section of Attachment E. Noncancer hazard indices, summed for all chemicals and all exposure pathways, and theoretical excess lifetime cancer risks, summed for all chemicals and all pathways in each unit are presented here. OEPA requires that summed non-cancer hazard values be less than one, and that summed theoretical excess lifetime cancer risks be less than one in one million, or 1 x 10<sup>-6</sup>. The data indicate that these values are within the acceptable limits for each unit. These data are presented in Table 10-3.

#### 10.8 Uncertainty Analysis

The uncertainty analysis section of Attachment E qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the USEPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in an actual situation.

Thus, the risks documented in this report are far in excess of those which would be anticipated to actually occur. Details on the basis for these conclusions are presented in the risk assessment document.

#### 10.9 Conclusion

The results for the three units, the Former Incinerator, the South Pad and the West Pad, incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are within the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991). No subsequent evaluation or post-closure monitoring is recommended.

#### **TABLE 10-1**

#### CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	Xylene Ethylbenzene Methylene Chloride
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

TABLE 10-2
BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	(mg/kg-day) <sup>-1</sup>	(mg/kg-day) <sup>-1</sup>
Xylene	2.0 E+0	2.0 E+0 <sup>1</sup>	NA <sup>2</sup>	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	8.6 E-1	7.5 E-3	1.6 E-3

<sup>&</sup>lt;sup>1</sup> In absence of inhalation reference dose, the oral reference dose was used.

References: U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

<sup>&</sup>lt;sup>2</sup> NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

SUMMARY TABLE FOR COMBINED HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS

**TABLE 10-3** 

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	6.20 E-03	8.83 E-07
Child/Incinerator Area	1.30 E-02	3.69 E-07
Adult/South Pad	1.42 E-02	6.62 E-07
Child/South Pad	3.19 E-02	2.77 E-07
Adult/West Pad	8.57 E-04	NA
Child/West Pad	1.92 E-03	NA

NA - No putative carcinogenic chemicals detected in this area

#### 11. SOIL SAMPLING AND ANALYSIS

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Sampling was performed by independent contractors, and the analysis was performed by an outside laboratory with an approved QA/QC plan for each parameter of interest. A copy of the laboratory's QA/QC qualifications was submitted to PPG. Actual QA/QC analysis is included in the analytical reports or available from the laboratory.

A summary of all 1989 soil sampling analytical results is included in Attachments A and B. Attachment A includes the results of all analyses performed during the Partial Closure activities under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds.

In September 1992, PPG conducted additional sampling at the South Pad, West Pad and Former Liquid Waste Incinerator as agreed to in PPG's letters to OEPA dated July 27, 1992 and August 7, 1992. Results of this additional sampling effort are summarized in the Closure Plan Addendum presented in Attachment C. This addendum was submitted separately to OEPA on December 11, 1992. On March 24, 1993 additional minor sampling was conducted to determine the vertical extent of methylene chloride contamination at the Former Liquid Waste Incinerator and South Pad Drum Storage Areas. Samples were also collected to determine the leachability of constituents of concern from soil to groundwater using the TCLP procedure. The results of this sampling were submitted to OEPA separately in a letter dated June 25, 1993.

The following Sections 11.1 through 11.4 summarize the soil sampling activities and results from the Partial Closure Activities performed in 1989. Attachment C describes the 1992 additional soil sampling program.

The results of these sampling efforts have established that no constituents of concern occur at unacceptable risk levels. Detectable concentrations of methylene chloride were identified in 12"-24" samples from two locations at the Former Liquid Waste Incinerator (Grids 24 and 45) and one location at the South Drum Storage Area (Grid 100). To further define the occurrence of methylene chloride at depths below the 24" level from the units being closed, PPG collected samples from these locations at depths of 24"-36", 36"-48" and 48"-60". The samples collected were analyzed, along with appropriate QA/QC samples, for methylene chloride using EPA SW-846 method 8240. Methylene chloride was not detected in any of these samples; therefore the vertical extent of methylene chloride contaminant has been fully defined.

#### 11.1 Incinerator Area

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The soil around the Former Liquid Waste Incinerator was tested in 1989 for constituents listed below at points designated by the hatched areas of the Sampling Grid as shown in Figure 11.1. The representative sample points noted on all Sampling Grids in this Plan (Figures 11.1, 11.2 and 11.3) were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. Samples were collected according to EPA soil sampling and chain-of-custody protocol and analyzed using EPA SW-846 methods. A power auger was used to remove the top four to six inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

One composite soil sample made up of all eighteen soil samples from the area was analyzed for all dioxins and furans according to SW-846 Method 8280, including 2,3,7,8- TCDD (polychlorinated dibenzo dioxin), 2,3,7,8-TCDF (polychlorinated dibenzo furan), and PCBs (Polychlorinated Biphenyls) according to SW-846 Method 8080. Ignitability was not checked because there is no approved method of testing flashpoint of solids. The samples were not analyzed for heavy metals because metals were not used in manufacturing processes at the facility where the waste was generated.

It is unlikely that spills occurred in the incinerator area because of the closed piping system. The most likely source of leakage, if it occurred, would have been at the connection to the incinerator. No contaminated runoff occurred to the best of PPG's knowledge because of the containment pad around the incinerator. Samples were taken in the areas designated in Figure 11.1.

The results of the sampling are summarized in Attachments A, B and C. Analysis of samples collected from Grid Locations 24 and 45 on March 24, 1993 have defined the extent of vertical contamination, therefore, the Incinerator Area can be considered clean closed.

#### 11.2 Still Pad

Sediment grab samples were obtained in 1989 from the bottom of the two grated cover manholes in this area. The sediment samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition; methanol, butanol, isobutanol, and butyl cellosolve were quantified according to SW-846 Methods 5030 and 8015. These samples also were analyzed for PCBs according to SW-846 Method 8080.

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East Yard were removed and replaced. A summary of analytical results from post remediation sampling is included in Table 11.1. To clarify the data presented in Table 11.1, Manhole #3 was within the area of the Still Pad and Manhole #2 was upgradient in the storm sewer system and closer to the source of VOC contamination (bulk product loading). A sketch of this portion of the East Yard showing the Still Pad and the location of the manholes and storm sewers is included in Figure 4.2. The Still Pad is considered cleaned closed and no further action is necessary.

#### 11.3 South Drum Storage Area

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.2, using methods previously described under Section 11.1. Analyses for HSL volatiles organics and alcohols were performed as described in Section 11.1.

Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B, and C. Analysis of samples collected from Grid Location 100 has defined the extent of vertical contamination; therefore, the South Pad Drum Storage Area can be considered clean closed.

#### 11.4 West Drum Storage Pad

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.3, using the methods previously described under Section 11.1. Analyses for HSL volatile organics and alcohols were performed as described in Section 11.1.

One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B and C. Since no constituents were detected at unacceptable risk levels, the West Pad is considered clean closed, and no further action is required.

#### **TABLE 11.1**

## EAST YARD POT-REMEDIATION SAMPLING RESULTS VOC AND PCB ANALYSIS All Results in µg/kg

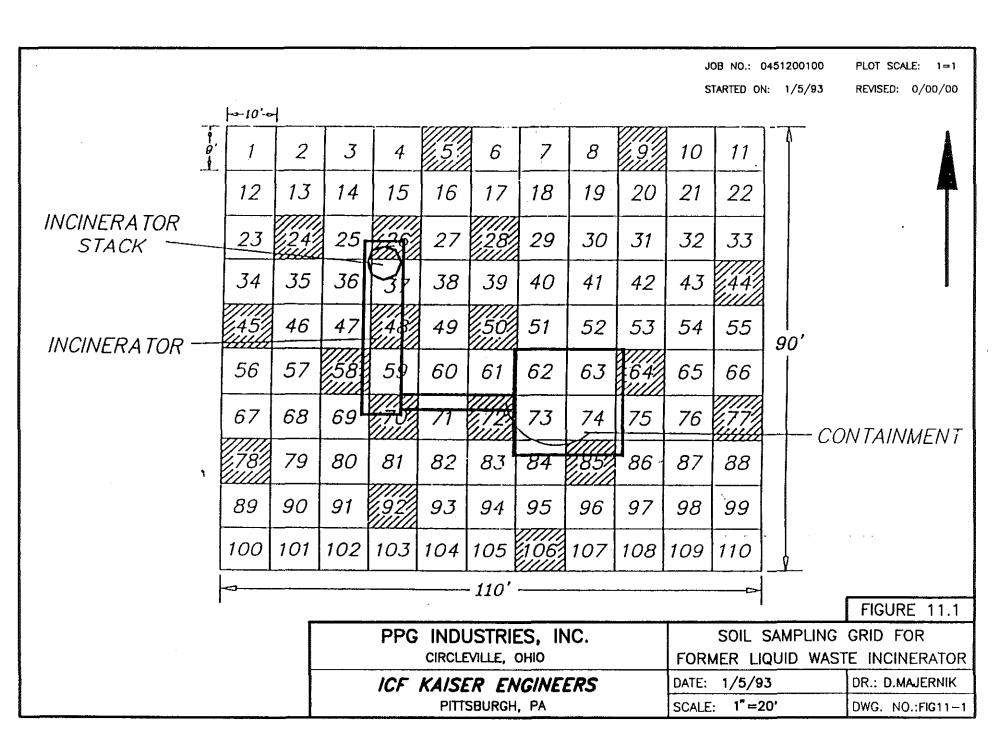
	Manhole #2 Area	Manhole	#3 Area
Volatiles	CV-89-0691	CV-89-0688	CV-89-0689
2-Butanone	920 J	490 J	800 J
Toluene	2100	580 U	800 U
Ethylbenzene	51000	2500	7000
Xylene	330000	24000	21000
4-methyl-2-pentanone	3700 U	1200 U	1600 U
PCB (A-1248)	2,100,000/1,500,000	590 U	3500

Letters refer to standard CLP qualifiers.

Note: Manhole #2 is located upgradient of the Still Pad.

Manhole #3 was within the area of the Still Pad.

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			15	16	17	18	19	-20	21	22	23	24	25	2		
	2	7	28	29	30	31	32	33	34	<i>3</i> 5	36	37	38	3	9	
	4		41	42	43	44	45	46	47	48	49	50	51	5	2	
	5	3	54	55	56	<i>57</i>	58	59	60	61	62	63	64	6	5	
	6	3	67	68	69	70	71	72	73	74	75	76	11	7	3	110
	7	)	80	81	82	83	84	85	86	87	88	89	90	9		
	9	?	93	94	95	96	97	98	99	100	101	102	103	10	4	
	10	5	106	107	108	109	110		<b>N12</b>	113	114	115	116	11	7	
	1	8	119	120	121	122	123	124	125	126	127	128	129			
	13	1	132	133	134	135	136	137	138	139	140	141	142	14	1.3	<u>\forall </u>
	<b>—</b>			<del></del>	<u> </u>	<del></del>		- 260'							- <del></del>	
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						ICF			INEERS	<u> </u>	DATE: 1	<del>`</del> :		DR.: D.	MAJEI	RNIK
							PITT	SBURGH, I	PA		SCALE:	1"=30'		DWG. N	√0.: FI	G11-2

JOB NO.: 0451200100

PLOT SCALE: 1=1

STARTED ON: 1/5/93

REVISED: 0/00/00



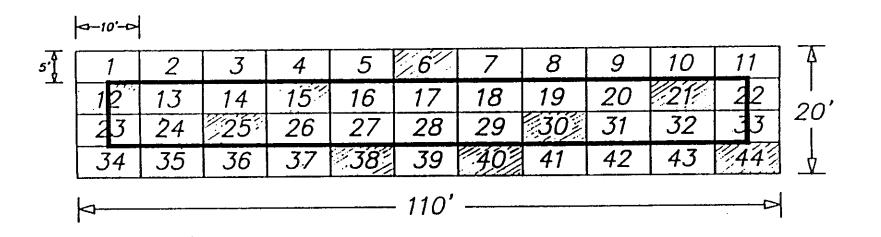


		FIGURE 11.3
PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLIN WEST PAD (1	
ICF KAISER ENGINEERS	DATE: 1/5/93	DR.: D.MAJERNIK
PITTSBURGH, PA	SCALE: 1"=15'	DWG. NO.: FIG11-3

#### 12. DESCRIPTION OF REMOVAL EFFORTS

#### 12.1 Incinerator Area

As described in Section 9, initial activities in 1989 were directed toward removal of residues from the Former Liquid Waste Incinerator, associated equipment, waste feed lines and the aqueous waste feed line. Due to the difficulty, expense, and subsequent waste generation, the incinerator and associated equipment was dismantled and treated as a hazardous waste. The incinerator foundation and containment pad concrete were also later removed. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. No soil was deliberately removed from the area, however, some soil was moved incidental to the concrete removal. These materials were loaded directly into rolloff boxes or dump trailers. No waste from this area was stockpiled on site. The materials were transported directly to the Adams Center Landfill in Fort Wayne, Indiana. A summary of wastes removed from this area is included in Table 12.1.

#### 12.2 Still Pad

Results of rinseate analyses of the Still Pad, as described in Section 9, indicated that the concrete met the requirements for clean closure. However, subsequent activities in this area necessitated the removal of the Still Pad concrete. Although this concrete may have been considered "non-hazardous" under 40 CFR part 261, it was disposed of as a hazardous waste. The concrete was broken up and removed down to the underlying soil. The only soil removed was incidental to concrete removal as described in Section 12.1. The concrete was loaded directly onto rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

#### 12.3 South Drum Storage Area

The concrete consolidation pad was broken up and removed down to the underlying soil. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. The only soil removed was incidental to concrete removal as described in Section 12.1. The waste was loaded directly into rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

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#### 12.4 West Drum Storage Pad

Initial sampling in 1989 was described in Section 11 indicated that the existing soils in the West Pad Drum Storage Area met the requirements for a clean closure. As a result, no material was removed from this area during closure activities.

TABLE 12.1
SUMMARY OF MATERIAL REMOVED

Area	Waste Type	Approximate Quantities Removed (lbs)	Manifest Numbers
Incinerator	Equipment, refractory	17,140	1484
		30,480	1485
		33,200	1486
Incinerator	Waste feed piping,	31,120	1672
	foundation, containment pad	30,280	1673
Still Pad	Concrete, soil	32,040	1654
	,	28,900	1655
		31,100	1656
		37,320	1657
	•	40,540	1658
		28,620	1659
		34,500	1660
		26,800	1661
	•	37,500	1662
		51,860	1663
		26,920	1664
		28,900	1665
		29,400	1666
		29,470	1667
		40,500	1668
		40,180	1669
		28,020	1670
		29,600	1671
South Pad	Concrete,		
	Consolidation Pad	29,120	1674

#### 13. SPECIFIC CONSIDERATIONS

This section is reserved for details which are specific for landfill closures. The units covered under this Partial Closure are being clean closed per a risk assessment demonstration. Hence, no specific considerations are applicable.

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#### 14. DESCRIPTION OF EQUIPMENT CLEANING

The following describes the equipment cleaning efforts used in the vicinity of each of the interim status hazardous waste management units being closed. Residues generated by the scraping of equipment were handled as hazardous waste. Equipment was placed on a curbed, lined area and a pressure washer was used to remove any contamination. The decontamination areas were visqueenlined, and large enough to ensure that no overspray was distributed outside the lined area. All recovered water was collected into a sump and then pumped into drums for sampling and analysis. Any rinse water which came in contact with listed hazardous wastes was managed as a listed waste. All decontamination pad plastic lining was disposed of in bulk or drummed and managed as a hazardous waste.

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#### 15. CERTIFICATION

PPG will provide certification that the former Liquid Waste Incinerator and three drum storage pads have been closed in accordance with the approved Partial Closure Plan. An independent registered Professional Engineer was present during critical stages of closure activities, such as incinerator demolition, line flushing and decontamination of the storage pads. The Documentation Report for these 1989 activities is included as Attachment H. This Engineer has documented that Partial Closure activities were performed in accordance with the applicable regulations and were consistent with the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988. Upon approval of this Plan, which includes a risk assessment demonstration of clean closure, an independent registered Professional Engineer will certify that the Partial Closure is in accordance with the approved plan. PPG will certify closure in accordance with 40 CFR 265.115 and OAC 3745-66-15.

#### 16. STATUS OF THE FACILITY AFTER CLOSURE

After the completion of partial closure activities, the Still Pad (see Figure 1.2) was converted to a satellite storage or "less-than-90-day-storage" area. The former Liquid Waste Incinerator in the manufacturing area and the other drum storage areas (the South Pad and West Pad) were permanently closed. The remainder of the hazardous waste management units at the PPG Circleville facility, which includes the ERU and five hazardous waste storage tanks at the resin plant, remain in operation.

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#### ATTACHMENT A

Partial RCRA Closure - Analytical Summary

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SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221		7137	CV-89-0221	Still Pad	M.H. Sediment Sample	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right @ Right Ethylbenzene Meth. Chloride Xylenes	BDL BDL 2.48 0.228 0.335	mg/kg mg/kg mg/kg mg/kg mg/kg	Varies 0.167 0.167 0.167	,
						17-Apr-89 17-Apr-89	@ Right Arodor 1248	BDL 6.700	mg/kg mg/kg	1.0 1.0	Analysis for 9 PCBs all BDL except below
CV-89-0223		7137	C'V-89-0222	Still Pnd	Pipe Sediment Sample	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right @ Right MEK Xylenes	BDL BDL 15.3 167.5	mg/kg mg/kg mg/kg mg/kg		Analysis for Methanol, Iso-butanol, Butanol, & Butyl Callosofve Analysis for HSL Volstiles all BDL except below
						17-Apr-89 17-Apr-89	@ Right Arodor 1248	BDL 41,400	mg/kg mg/kg	1.0 1.0	Analysis for 9 PCBs all BDL except below
CV-89-0223	~	7137	CV-89-0223	Still Pad	3rd Rinse	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right Butyl Cellosolve @ Right Meth. Chloride	BDL 85.4 BDL 169	mg/kg mg/L µg/L µg/L	1.0 1.0 Varies 100	Initial run results shown, confirmed @ 84.1 mg/L
			ļ	<del> </del>		17-Apr-89	@ Right	BDL	ug/L	1.0	Analysis for a PCBs and BDL
CV-89-0224		7137	CV-89-0224	Still Pad	Rinsewater Source	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right Methanol @ Right Acetone Meth. Chloride	BDL 6.95 BDL 22.3 3.2	mg/L mg/L μg/L μg/L μg/L	1.0 1.0 Varies 10.0 2.00	Anlysis for Iso-butanol, Butanol, & Butyl Cellosolve  Analysis for HSL Volatiles all BDL except below
						17-Apr-89	@ Right	BDL	μg/L	1.0	Analyses for 9 PCBs all BDL
8-131	S-131	7137	JC5491	South Pad	Soil Sample	17-Jul-89 17-Jul-89 17-Jul-89	@ Right @ Right Toluene	BDL BDL 2	mg/kg mg/kg mg/kg	0.965 Varies 0.3	
003	S-132	7137	JC5492	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volsties all BDL
004	S-135	7137	JC5493	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.11	mg/kg mg/kg mg/kg	0.972 0.972 0.3	
005	S-136	7137	JC5494	South pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.6	mg/kg mg/kg mg/kg	0.950 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL except below
006	S-137	7137	JC5495	South Pad	Soit Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.971 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
007	S-140	7137	JC5496	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
008	S-130	7137	JC5497	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
009	S-129	7137	JC5498	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/tg mg/tg	0.967 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
010	S-126	7137	JC5499	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.950 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
011	S-124	7137	JC5500	South pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
012	S-121	7137	JC5501	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
013	S-107	7137	JC5502	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Toluene	BDL BDL 0.3 0.4	mg/kg mg/kg mg/kg mg/kg	0.971 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
014	S-109	7137	JC5503	South pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.992 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
015	\$-109	7137	JC5530	Sout Pad	Soil Sample (Dupt. S-109)	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.6	mg/kg mg/kg mg/kg	0.969 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDI., except below
016	S-113	7137	HC5504	South Pad	Soit Sample	18-Jul- <del>8</del> 9 18-Jul- <del>8</del> 9	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.993 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
017	S-111	7137	JC5505	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.967 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
018	\$-112	7137	JC5506	South Pad	Soil Sample	18-July-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.977 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
019	S-115	7137	JC5507	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.973 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
920	S- 102	7137	JC5508	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
021	S-100	7137	JC5509	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Toluene Xylenes	BDL BDL 2 0.3 21 8	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.6 0.3 0.3 0.3	Analysis for HSL Volatiles all BDL, except below
0722	S-%	7137	JC5510	South Ped	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
023	S-93	7137	JC5511	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,988 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
024	S-80	7137	JC\$512	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.5	mg/kg mg/kg mg/kg	0.964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below

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SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
025	S-88	7137	JC5513	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth, Chloride Toluene	BDL BDL 0.5 2	mg/kg mg/kg mg/kg mg/kg	0.999 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
026	S-82	7137	JC5514	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,957 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C541	C541	7137	JC5541	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right Arclor 1254	BDL 0.334	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs all BDL, except below
027	S-77	7137	JC\$\$15	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.966 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
028	S-76	7137	JC5516	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Toluene Xylenes	BDL BDL 0.3 17 0.16	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.993 Varies 0.3 0.3 6.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
029	S-72	7137	JC5517	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Xylenes	BDL BDL 0.4 0.3 0.18	mg/kg mg/kg mg/kg mg/kg mg/kg	1.000 Varies 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
030	S-70	7137	JC5518	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
031	S-69	7137	JC5519	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Toluene Xylenes	BDL BDL 0.3 3 1	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.990 Varies 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
032	S-65	7137	JC5520	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chlorde	BDL BDL 0.8	mg/kg mg/kg mg/kg	0.974 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
033	S-65	7137	JC5540	South Pad	Soil Sample (Dupi, S-55)	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.977 - Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
034	S-58	7137	JC5521	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Toluene	BDL BDL 0.3 0.3	mg/kg mg/kg mg/kg mg/kg	0.962 Varies 0.3 0.3	Analysis for п-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, ехсерт below
035	S-61	7137	JC5522	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.976 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
036	S-49	7137	JC5523	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,953 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

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SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
037	S-44	7137	JC5524	South Pad	Soil Sample	18-1ग1-85 18-1ग1-85	© Right © Right	BDL BDL	mg/kg mg/kg	0.952 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
038	S-40	7137	JC5525	South Pad	Soil Sample	8-Jul-89   8-Jul-89   18-Jul-89	<ul><li>Right</li><li>Right</li><li>Toluene</li></ul>	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
039	S-26	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
040	S-34	7137	JC5527	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0,96) Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL.
041	S-31	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.965 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
042	S-38	7137	JC5529	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
043	S-26	7137	JC5530	South Pad	Soil Sample	18-1ग-89 18-1ग-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	*7:r 0.966 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
044	5-24	7137	JC5531	South Pad	Soil Sample	18-Jน1-89 18-Jน1-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.953 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
045	S-21	7137	IC5532	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.960 Varios	Analysis for zi-Butanol, isobutanol, and Mothanol Analysis for HSL Volatiles all BDL
046	S-17	7137	JC5533	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
047	<b>S-5</b>	7137	IC5534	South Pad	Soil Sample	18-1n1-89 18-1n1-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.979 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
048	S-14	7137	JC5535	South Pad	Soil Sample	18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.999 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
049	S-9	7137	JC5536	South Pad	Soil Sample	18-141-89 18-141-89	Ø Right Ø Right	BDL. BDL	mg/kg mg/kg	0.996 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
050	S-11	7137	IC5537	South Pad	Soil Sample	18-Jul-89	© Right © Right	BDL BDL	mg/kg mg/kg	0.993 Varice	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
051	S-13	7137	IC5538	South Pad	Soil Sample	18-1¤1-89 [¾-1¤1-89	@ Right @ Right	BDL BDL	mg kg mg/kg	0.983 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C544	C544	7137	JC5542	South Ped	Soil Sample	18-Jul-89 18-Jul-89	@ Right Aroclor 1254	BDL 3.56	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs and BDL, except below
052		7137	JC5552	General	Water Sample (Trip Blank)	[8-Jul-89 [8-Jul-89	Ø Right Ø Right	BDL BDL	mg/L mg/L	1.000 Varies	Analysis for ti-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
053	W-44	7137	JC5543	West Pad	Soil Sample	8-Jul-89  8-Jul-89  8-Jul-89  8-Jul-89	Ø Right Methenol Ø Right Tohtene	BDL 0.968 BDL 1.34	mg/kg mg/kg mg/kg mg/kg	0.988 0.968 Varica 0.196	Analysis for n-Busanol and Isobusanol Only detected alcohol in West Pad soils Analysis for HSL Volatiles, all BDL except below

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SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
054	W-21	7137	JC5544	West pad	Soil Sample	(8-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
055	W-30	7137	JC5545	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
056	W-40	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,968 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatifes all BDL
057	W-6	7137	JC5547	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.229 2.16	mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.186 0.186	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
058	W-38	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.621	mg/kg mg/kg mg/kg	0.973 Varies 0.190	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
059	W-15	7137	JC5549	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0.977 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
960	W-26	7137	JC5550	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0,944 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
061	W-12	7137	JC3551	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL, 0.454	mg/kg mg/kg mg/kg	0.979 Varies 0.199	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C342	C542	7137	JC5554	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs, all BDL
062	W-12	7137	JC5553	West Pad	Soil Sample (Dupl. W-12)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	1.9	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Rigut	BDL BDL	mg/kg mg/kg	0.975 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
964	i-44	7137	JC\$556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.929 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
965	1-77	7137	JC5557	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
066	1-64	7137	JC5558	Incinerator Area	soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.3 0.9	mg/kg mg/kg mg/kg mg/kg	0.967 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except BDL
067	1-85	7137	JC5559	Incinerator Area	Soit Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.6 0.7	mg/kg mg/kg mg/kg mg/kg	0.996 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
068	I-106	7137	JC5560	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
069	l-72	7137	JC5561	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0.962 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
070	1-72	7137	JC5573	Incinerator Area	Soil Sample (Dupl. 1-72)	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Xylenes	BDL BDL 0.4 1.7	mg/kg mg/kg mg/kg mg/kg	0.933 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
071	1.92	7137	JC5562	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
<b>672</b>	Į-70	7137	JC5563	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.944 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
073	I-76	7137	JC5564	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.932 Varies	Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL
074	I-26	7137	JC5565	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.990 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSt. Volatiles all BDL
075	1-58	7137	JC3566	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0.955 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
076	I-6	7137	JC5567	Incinerator Area	Soit Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0.991 Varica	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volstiles all BDL
977	1-24	7137	JC5568	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Xylenes	BDL BDL 2 4	mg/kg mg/kg mg/kg mg/kg mg/kg	0.969 Varies 0.3 0.3 0.3	Analysis for n-Butanol, Isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
078	I-26	7137	JC55 <del>69</del>	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth, Chloride	BDL BDL 0.4	mg/kg mg/kg mg/kg	0,992 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BOL, except below
079	1-48	7137	JC5670	Incinerator Area	Soit Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL Q4	mg/kg mg/kg mg/kg	0.978 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
080	1-45	7137	JC5571	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethythenzene 2-Hexanone Meth. Chloride Xytenes	BDL BDL 0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg mg/kg	0.945 Varies 0.3 0.6 0.3 0.3	Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL, except below
081	1-60	7137	JCS572	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.931 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C543	C543	7137	JC5574	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right Aroclor 1254 @ Right HpCDD OCDD 2,37,a-TCDF TCDF	BDL 1.79 BDL 0.37 1.91 0.15 0.22	mg/kg mg/kg µg/kg µg/kg µg/kg µg/kg	0.25 0.25 Varies  	Analysis for 7 PCBs all BDL except below  Analysis for 12 Cibenzo-P-Dioxins & Furene all BDL except below

RES

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						SAMPLE				DETECTION	
SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	DATE	ANALYSIS FOR	RESULTS	UNITS	LIMIT	COMMENTS
985		7137	085	Incinerator	Final Phase Line 2	24-Aug-89	Methanol	93.1	mg/L	1.0	
	]	1	1	1	1	24-Aug-89	Iso-Butanol	10.1	mg/L	1.0	
	1				i	24 Aug-89	Butanol	86.3	mg/L	1.0	
		I	ŀ			24-Aug-89	@ Right	BDL.	μg/L	Varice	
		i				24-Aug-89	2-Butanone	39,000	μg/L	1,000	Analysis for HSL, Volatiles all BDL except below
				ŀ		24-Aug-89	Ethylbenzene	36,000	μg/L	500	
		•	1			24-Aug-89	2-Hexanone	720,000	μg/L	1,000	
	ł	ŀ		1		24-Aug-89	Toluene	75,000	µg∕L	500	
						24-Aug-89	Xylence	240,000	μg/L	\$00	
086		7137	066	Incinerator	Distilled Rinse Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
	1	-				24-Aug-89	@ Right	BDL	µg/L		Analysis for HSL Volatiles all BDL, except below
			1	\		24-Aug-89	Toluene	170	μg/L	6	
087		7137	067	Incinerator	Service Water	24-Aug-89	@ Right	BDL	mg/L	10	Analysis for n-Butanol, isobutanol, and Methanol
		1.57		likaliei aloi	Cross visite 14 miles	24-Aug-89	@ Right	BDL	μg/L		Analysis for HSL Volatiles all BDL
068		7137	088		Travel Blank	24-Aug-89	@ Right	BDL	րբ/Լ	Vada	Analysis for HSL Volstiles all BDL
	<u> </u>	7137	060	Incinerator	Triver Diank	2+Vn8-04	@ Kipii	BDL	hB/r	Varies	Allaysis to 1150 vostice as DDE
089	-	7137	089	Incinerator	Final Rime Line 1	24-Aug-89	Methanol	16.5	mg/L	1.0	
	l			1	1	24-Aug-89	Iso-butanol	1.71	mg/L	1.0	
			l		· ·	24-Aug-89	Butanol	18.9	mg/L	1.0	
1	1	:	j		1	24-Aug-89	@ Right	BDL	μ <b>2</b> /L.	Varies	A A C LICE IV-L-Page (CDD)
	1		1	<b>\</b>	1	24-Aug-89	2-Butanone	11,000	µg/L		Analysis for HSL Volatiles all BDL, except below
	i		!			24-Aug-89	Ethylbenzene	24,000	μg/L	1,000 1,000	
	1	ŀ		İ		24-Aug-89 24-Aug-89	2-Hexanone Toluene	300,000 33,000	μg/L μg/L	600	
	ļ		i		1	24-Aug-89	Xylenes	180,000	μg/L μg/L	600	
			<del> </del>	<del> </del>	<del> </del>	2+708-03	Ayrence	100,000	PASE		
090	-	7137	090	Incinerator	Final Rinse Aqueous Waste	24-Aug-89	@ Right	BDL	mg/L	1.0	_
			į.		l	24-Aug-89	@ Right	BDL	μ∦/∟		Analysis for n-Butanol, isobutanol, and Methanol
			1	i	1	24-Aug-89	Ethylbenzene	9,900	μg/L	500	Analysis for HSL Volatiles all BDL, except below
		l				24-Aug-89	2-Нешпопе	1,900	μg/L	1,000	
			l			24-Aug-89	Toluene	15,000	μg/L	500	
				L		24-Aug-89	Xylenes	31,000	μg/L	500	

#### ATTACHMENT B

Partial RCRA Closure - Detected Compound Summary

Partial Closure Plan 04512-08-C

#### PPG - CIRCLEVILLE PARTIAL RCRA CLOSURE - DETECTED COMPOUND SUMMARY

#### Attachment B

											Attachment
SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	-	7137	CV-89-0221	STILL PAD	M.H. SEDIMENT SAMPLE	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	ETHYLBENZENE METH, CHLORIDE XYLENES ARCOCLOR 1248	2,48 0.228 0,335 6,700	mg/kg mg/kg mg/kg mg/kg	0.167 0.167 0.167 1.0	
CV-89-0222	·	7137	CV-89-0222	STILL PAD	PIPE SEDIMENT SAMPLE	17-Apr-89 17-Apr-89 17-Apr-89	MEK XYLENES AROCLOR 1248	15.3 167.5 41,400	mg/kg mg/kg mg/kg	4.00 4.00 1.0	
CV-89-0223	-	7137	CV-89-0223	STILL PAD	3rd RINSE	17-Apr-89 17-Apr-89	BUTYL CELLOSOLVE METH. CHLORIDE	85.4 169	mg/L ug/L	1.0 100	Initial run results shown, confirmed @ 84.1 mg.L
CV-89-0224	-	7137	CV-89-0224	STILL PAD	RINSEWATER SOURCE	17-Apr-89 17-Apr-89 17-Apr-89	METHANOL ACETONE METH. CHLORIDE	6.95 22,3 3.2	mg/L ug/L ug/L	1.0 10.0 2.0	
S-131	S-131	7137	S-131	SOUTH PAD	SOIL SAMPLE	17-Jul-89	TOLUENE	2	mg/kg	0.3	
004	S-135	7137	004	SOUTH PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.11	mg/kg	0,3	
005	S-136	7137	005	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.8	mg/kg	0.3	
010	S-126	7137	010	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
013	S-107	7137	013	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH. CHLORIDE TOLUENE	0.3 0.4	mg/kg mg/kg	0.3 0.3	
015	S-109	7137	015	SOUTH PAD	SOIL SAMPLE (DUPL S-109)	18-Jul-89	XYLENES	0.6	mg/kg	0.3	
018	S-112	7137	018	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
021	S-100	7137	021	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE TOLUENE XYLENES	2 0.3 21 8	mg/kg mg/kg mg/kg mg/kg	0.6 0.3 0.3 0.3	
024	S-80	7137	024	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.5	mg/kg	0.3	
025	S-88	7137	025	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH. CHLORIDE TOLUENE	0,5 2	mg/kg mg/kg	0.3 0.3	
C541	C541	7137	JC6641	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	0.334	mg/kg	0.25	
027	S-77	7137	027	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
028	S-76	7137	028	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE TOLUENE XYLENES	0.3 17 0.16	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
029	S-72	7137	029	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	0.4 0.3 0.18	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
031	S-69	7137	031	SOUTH PAD	SOIL SAMPLE	18-Jui-89 18-Jui-89 18-Jui-89 18-Jui-89	ETHYLBENZENE METH. CHLORIDE TOLUENE XYLENES	0.3 3 1 1.8	mg/kg mg/kg mg/kg mg/kg	0.3 0.3 0.3 0.3	

							,				
SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
032	S-55	7137	032	SOUTH PAD	SOIL SAMPLE	18-Jul- <b>89</b>	METH. CHLORIDE	0.8	mg/kg	0.3	
033	S-55	7137	033	SOUTH PAD	SOIL SAMPLE (DUPL. S-55)	18-Jul-89	METH CHLORIDE	0.3	mg/kg	0.3	
634	S-58	7137	034	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH, CHLORIDE TOLUENE	0.3 0.3	mg/kg mg/kg	0.3 0.3	
035	S-61	7137	035	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.3	mg/kg	0.3	
038	S-40	7137	038	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
C544	C544	7137	JC5542	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	3.56	mg/kg	0.25	
053	W-44	7137	JC5543	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METHANOL TOLUENE	0.968 1.34	mg/kg mg/kg	0.968 0.198	Only detected alcohol in West Pad soils
057	W-6	7137	JC5547	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.229 2.16	mg/kg mg/kg	0.186 0.186	
058	W-38	7137	JC5548	WEST PAD	SOIL SAMPLE	18-Jul- <b>89</b>	TOLUENE	0.621	mg/kg	0.190	
061	W-12	7137	JC5551	WEST PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.454	mg/kg	Q 199	
066	1-64	7137	066	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.3 0.9	mg/kg mg/kg	Q3 Q3	
067	I-85	7137	067	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.6 0.7	mg/kg mg/kg	0.3 0.3	
070	1-72	7137	070	INCINERATOR AREA	SOIL SAMPLE (DUPL. 1-72)	18-Jul-89 18-Jul-89	METH CHLORIDE XYLENES	0.4 1.7	mg/kg mg/kg	0.3 0.3	
972	1-70	7137	072	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
077	1-24	7137	077	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	2 4 4	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
078	1-28	7137	078	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
079	J-48	7137	079	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	XYLENES	0.4	mg/kg	0.3	
080	1-45	7137	080	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE 2-HEXANONE METH. CHLORIDE XYLENES	0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg	0.3 0.6 0.3 0.3	
081	1-50	7137	081	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.4	mg∕kg	0.3	
C543	C543	7137	JC5574	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	AROCLOR 1254 HpCDD OCDD 23,7,8-TCDF TCDP	1.79 0.37 1.91 0.15 0.22	mg/kg ug/kg ug/kg ug/kg ug/kg	0.25	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
065	-	7137	065	INCINERATOR	FINAL RINSE LINE 2	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	METHANOL ISO-BUTANOL BUTANOL 2-BUTANONE ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	93.1 10.1 85.3 39,000 36,000 720,000 75,000 240,000	mg/L mg/L Mg/L ug/L ug/L ug/L ug/L	1.0 1.0 1.00 1,000 500 1,000 500	
086	-	7137	086	INCINERATOR	DISTILLED RINSE WATER	24-Aug-89	TOLUENE	170	ug/L	5	
089	٠	7137	089	INCINERATOR	FINAL RINSE LINE 1	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	METHANOL ISO-BUTANOL BUTANOL 2-BUTANONE ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	16.5 1.71 18.9 11,000 24,000 300,000 33,000 180,000	mg/L mg/L mg/L ug/L ug/L ug/L ug/L	1.0 1.0 1.00 1,000 1,000 500 500	
690	-	7137	090	INCINERATOR	FINAL RINSE AQUEOUS WASTE	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	9,900 1,900 15,000 31,000	ug/L ug/L ug/L ug/L	500 1,000 500 500	
CV-89-1503	·	9-21-89	12372-89	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89 18-Sep-89	@RIGHT BARIUM	BDL 1.1	mg/L mg/L	VARIES UNKNOWN	TCLP Analysis for 8 RCRA metals all BDL except below
CV-89-1503	-	9-21-89	9697	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89	@RIGHT	BDL	ug/L	VARIES	TCLP Analysis for 25 RCRA organics all BDL

#### ATTACHMENT C

Addendum to Sampling Activities
Associated with Partial Closure Plan

Partial Closure Plan 04512-08-C

# ADDENDUM TO SAMPLING ACTIVITIES ASSOCIATED WITH PARTIAL CLOSURE PLAN

#### **FOR**

## PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO

Prepared for:

PPG INDUSTRIES, INC. Coatings and Resins Circleville, Ohio

Prepared by:

ICF KAISER ENGINEERS, INC. Four Gateway Center Pittsburgh, Pennsylvania 15222

June, 1993

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Appendix A - Additional Sampling Program Correspondence Appendix B - Laboratory Raw Data							

#### 1.0 ADDENDUM INTRODUCTION

On January 14, 1991, PPG Industries, Inc. submitted a revised partial closure plan for four interim status RCRA TSD units identified as the Still Pad Drum Storage Area, West Drum Storage Pad, the South Drum Storage Pad, and the Former Liquid Waste Incinerator. Since the submittal of the revised plan, PPG and OEPA have engaged in several rounds of negotiations centering around the definition of the full extent of contamination attributed to three of these RCRA units, (West Drum Storage Pad, South Drum Storage Pad, and the Liquid Waste Incinerator).

This addendum presents a description of the field sampling conducted as a result of negotiations with OEPA, the results of sample analysis and a brief discussion of the results.

Attachment C 04512-03-A

#### 2.0 SAMPLING AND ANALYSIS PLAN

#### 2.1 INTRODUCTION

The purpose of this section is to describe the sampling methodology and analysis associated with the collection of soil samples offered in response to OEPA comments as presented in PPG's letters dated July 27, 1992, and August 7, 1992. The Proposed Sampling Program was subsequently approved by the Ohio EPA on August 31, 1992. Appendix A includes copies of the correspondence.

#### 2.2 FIELD SAMPLING ACTIVITIES

#### 2.2.1 Re-establishment of Grids

On September 21 and 22, 1992 a two man sampling crew re-established the sampling grid system originally associated with the closure activities of the Former Liquid Incinerator Pad, the West Pad Drum Storage Area, and the South Pad Drum Storage Area. As part of this activity, additional grids, as concurred with OEPA, were established to further define the possible extent of contamination.

Due to a missed holding time for some of the samples obtained from grids at the 12-24 inch interval on September 21-22, 1992, additional sampling was performed on October 31, 1992. Five additional soil samples and one field blank were obtained at that time. The location and sampling grids are presented below.

■ Former Liquid Incinerator Pad Grids 24 and 45

■ South Pad Drum Storage Grid 100

■ West Pad Drum Storage Grids 6 and 44

All sampling was performed following the same methodology used in prior sampling events. No variation of methods occurred.

#### 2.2.1.1 Former Liquid Incinerator Area

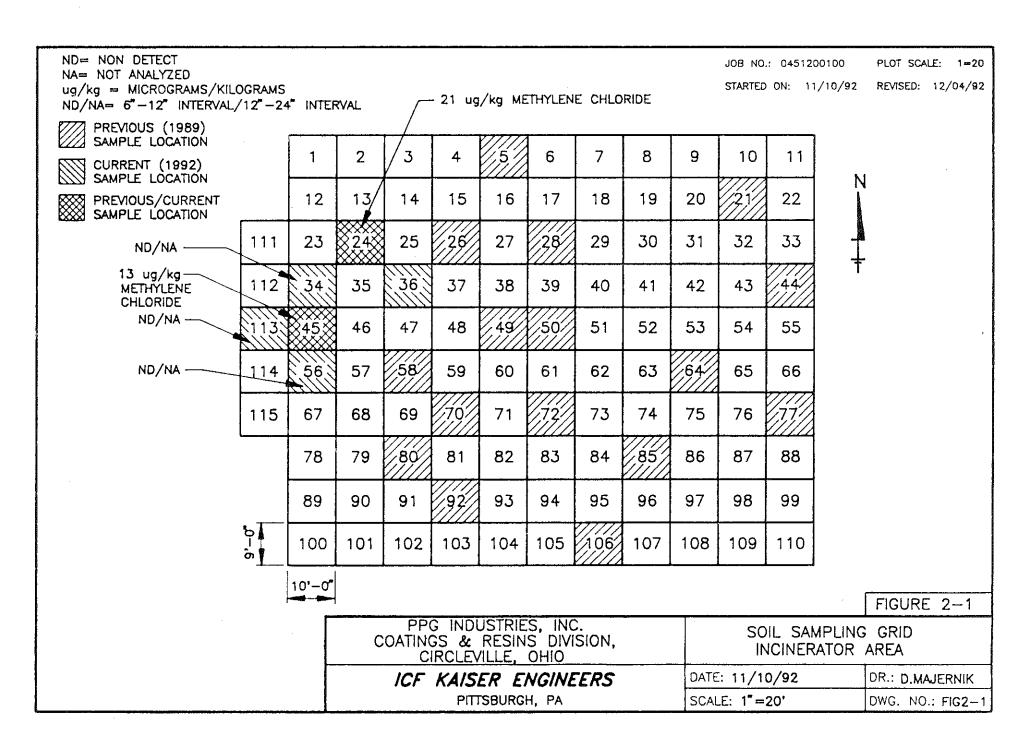
Sampling Grids 24, 34-36, 45-47 and 56-58 were re-established. Sampling grids 111-115 were added to the western boundary of the existing grid system. As part of the Former Liquid Incinerator Pad grid re-establishment procedure, the location of the former incinerator stack was verified from photos and previous work performed by plant personnel. Figure 2-1 illustrates the sample grid.

#### 2.2.1.2 West Pad Drum Storage

Along with the re-establishment of the former grid system, 16 new sampling grids were added. Grids 45-60 were added to the western and northern boundaries of the existing grid system. Figure 2-2 illustrates the sampling grid.

Attachment C 04512-03-A Revision: 3 Date: June 24, 1993

2-1



ND= NON DETECT PLOT SCALE: 1=15 JOB NO.: 0451200100 NA- NOT ANALYZED ug/kg = MICROGRAM/KILOGRAM STARTED ON: 11/10/92 REVISED: 12/04/92 ND/NA= 6"-12" INTERVAL/12"-24" INTERVAL PREVIOUS (1989) SAMPLE LOCATION **CURRENT (1992)** SAMPLE LOCATION PREVIOUS/CURRENT SAMPLE LOCATION 120'-0" ð 10'-0" ND/NA ND/NA ND/NA ហ <u>`51</u> 56 46 47 48 49 50 52 53 54 55 86X 2 3 5 8 9 10 11 57 15 13 16 17 18 19 20 22 58 14 23 24 26 27 28 29 (30) 31 32 33 59 60 35 **3**8 34 36 37 39 41 42 43 . . . . . . . . . . . – ND CONCRETE CURB -- ND - ND/NA FIGURE 2-2 PPG INDUSTRIES, INC. SOIL SAMPLING GRID COATINGS & RESINS DIVISION, WEST PAD CLOSURE CIRCLEVILLE. OHIO ICF KAISER ENGINEERS DATE: 11/10/92 DR.: D.MAJERNIK SCALE: 1"=15' PITTSBURGH, PA DWG. NO.: FIG2-2

#### 2.2.1.3 South Pad Drum Storage

Within the South Pad Drum Storage area previous grids 53, 66, 79, 92, 100 and 105 were reestablished. Additional grids, 144-154, were added to the west and southern portions of the grid system. Figure 2-3 illustrates the sampling grids.

#### 2.2.2 Soil Sampling Methodology

Soil samples obtained from new grids were collected at depths of 6-12 inches and 12-24 inches below the ground surface. A biased sampling approach was used to obtain samples from grids previously determined to contain detectable levels of chemicals. These samples were collected at a depth of 12-24 inches below the ground surface. Table 1 summarizes the grid numbers and sampling depths for each closure unit.

All samples were collected utilizing the following procedures. The first 6 inches of soil was removed using a hand-held stainless steel bucket auger. A stainless steel split-spoon was then manually driven to the desired depth to obtain the deeper sample. All sampling equipment was decontaminated between sample locations with a mild detergent followed by a deionized water rinse.

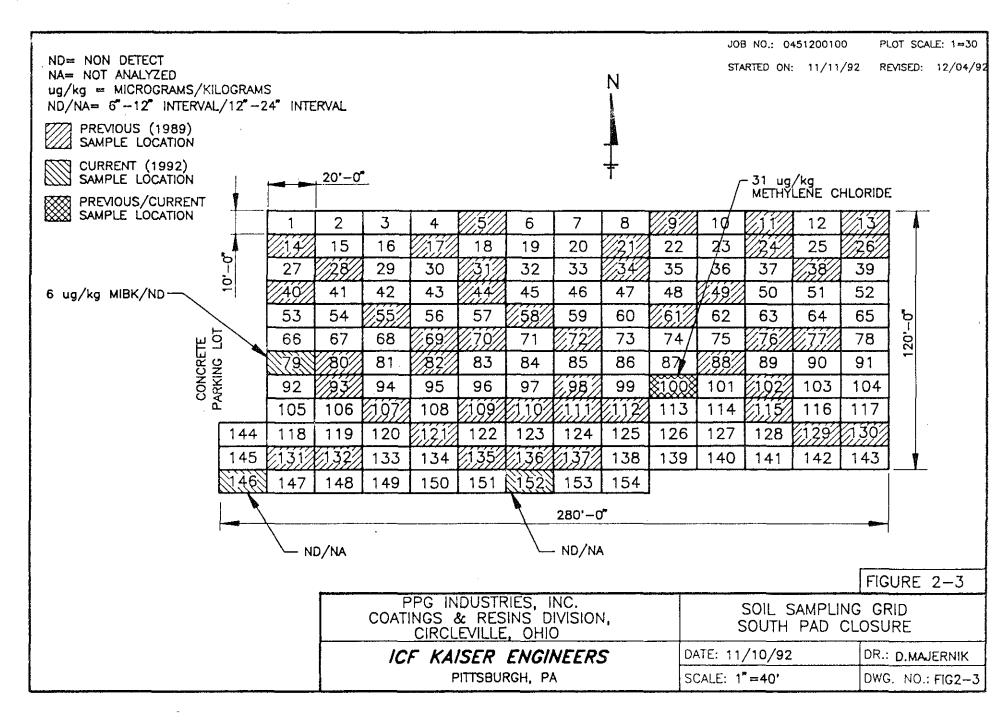
Approximately 4 oz. of material was collected from each split spoon for analysis. The sample was obtained by withdrawing the appropriate amount of soil from the split-spoon with stainless steel spatulas. Labels detailing, the name of the sampler, date, time, method of analysis and any preservatives were marked on the sampling jar. The samples were then placed on ice for shipment to the analytical laboratory.

#### 2.2.3 Sample Analysis

All soil samples were sent by overnight courier to NET, Cambridge Division in Bedford, Massachusetts for analysis. Soil samples were analyzed for Volatile Organic Compounds (VOCs) by EPA SW-846 Method 8240. Samples from the 6-12 inch depth interval were analyzed under a turnaround time of 5 days. The accelerated turnaround time allowed the corresponding 12-24 inch interval samples to be analyzed within the required holding time of 14 days. The initial soil samples were received at the NET Laboratories on September 24 and 25, 1992 and were analyzed by September 30, 1992. The second round of samples were received at the lab on November 2, 1992 and were analyzed by November 6, 1992.

A field blank was submitted to NET for each day of field activity for a total of three samples. NET ran a method blank at the beginning and end of each sample batch. A total of six method blanks were run.

Revision: 3 Date: June 24, 1993



#### 3.0 INVESTIGATION RESULTS

With the exception of sample CV-92-350-S79, all of the initially analyzed samples obtained on September 21-22, 1992 showed non-detectable levels of VOCs. Sample CV-92-350-S79 was obtained from Grid 79 at the South Pad Drum Storage Area at the 6-12 inch interval. The sample exhibited a trace concentration of 6.0 ug/kg 4-methyl-2-pentanone (MIBK). A summary of analytical results is included in Table 3-1. Raw analytical data are included as Appendix B.

Three of the five samples analyzed during the second sampling event (October 31, 1992) exhibited detectable concentrations of methylene chloride. These samples, as stated earlier, were obtained from grids previously determined to contain detectable levels of chemicals. Within the Former Liquid Incinerator Pad, the 12-24 inch sample from Grid 24 contained methylene chloride at 21 ug/kg and the 12-24 inch sample from Grid 45 contained methylene chloride at 13 ug/kg. In the South Pad Drum Storage Area, the 12-24 inch sample from Grid 100 exhibited a concentration of 31  $\mu$ g/kg methylene chloride. None of the West Drum Storage Pad samples showed detectable concentrations of VOCs.

Attachment C 04512-03-A

Revision: 3 Date: June 24, 1993

# TABLE 3-1 SOIL SAMPLE SUMMARY PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO

### SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-330-134	Incinerator Pad	34	9-24-92	6-12	8240	Non-Detect
CV-92-331-134	Incinerator Pad	34	9-24-92	12-24	8240	Not Analyzed
CV-92-332-136	Incinerator Pad	36	9-24-92	6-12	8240	Non-Detect
CV-92-333-136	Incinerator Pad	36	9-24-92	12-24	8240	Not Analyzed
CV-92-334-I56	Incinerator Pad	56	9-24-92	6-12	8240	Non-Detect
CV-92-335-156	Incinerator Pad	56	9-24-92	12-24	8240	Not Analyzed
CV-92-336-I113	Incinerator Pad	113	9-24-92	6-12	8240	Non-Detect
CV-92-337-I113	Incinerator Pad	113	9-24-92	12-24	8240	Not Analyzed
CV-92-338-124	Incinerator Pad	24	9-24-92	12-24	8240	Not Analyzed
CV-92-339-I45	Incinerator Pad	45	9-24-92	12-24	8240	Not Analyzed
CV-92-524-52A	Incinerator Pad	24	10-31-92	12-24	8240	21 ppb Methylene Chloride
CV-92-525-145	Incinerator Pad	45	10-31-92	12-24	8240	13 ppb Methylene Chloride
CV-92-340-W45	West Storage Pad	45	9-23-92	6-12	8240	Non-Detect
CV-92-341-W45	West Storage Pad	45	9-23-92	12-24	8240	Not Analyzed
CV-92-342-W51	West Storage Pad	51	9-23-92	6-12	8240	Non-Detect
CV-92-343-W51	West Storage Pad	51	9-23-92	12-24	8240	Not Analyzed
CV-92-344-W56	West Storage Pad	56	9-23-92	6-12	8240	Non-Detect
CV-92-345-W56	West Storage Pad	56	9-23-92	12-24	8240	Not Analyzed
CV-92-346-W60	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-347-W60A	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect

### TABLE 3-1 (Continued)

### SAMPLES COLLECTED AT THE CIRCLEVILLE, OHIO FACILITY

### SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-359-W60A	West Storage Pad	60	9-23-92	12-24	8240	Not Analyzed
CV-92-348-W6	West Storage Pad	6	9-23-92	12-24	8240	Not Analyzed
CV-92-349-W44	West Storage Pad	44	9-23-92	12-24	8240	Not Analyzed
CV-92-W6	West Storage Pad	6	10-31-92	12-24	8240	Non-Detect
CV-92W44	West Storage Pad	44	10-31-92	12-24	8240	Non-Detect
				<u> </u>		
CV-92-350-S79	South Storage Pad	79	9-23-92	6-12	8240	6 ppb MIBK
CV-92-351-S79	South Storage Pad	79	9-23-92	12-24	8240	Non-Detect
CV-92-354-S152	South Storage Pad	152	9-23-92	6-12	8240	Non-Detect
CV-92-355-S152	South Storage Pad	152	9-23-92	12-24	8240	Not Analyzed
CV-92-360-S146	South Storage Pad	146	9-24-92	6-12	8240	Non-Detect
CV-92-353-S146	South Storage Pad	146	9-24-92	12-24	8240	Not Analyzed
CV-92-356-S100	South Storage Pad	100	9-23-92	12-24	8240	Not Analyzed
CV-92-526-S100	South Storage Pad	100	10-31-92	12-24	8240	31 ppb Methylene Chloride

PPB: Parts Per Billion

#### 4.0 DISCUSSION OF RESULTS

The results of the 18 samples analyzed as part of the additional sampling program conducted in September and October 1992 can be summarized as follows:

- Fourteen (14) of the samples showed nondetectable levels of VOCs, including all of the samples taken in the West Drum Storage Pad.
- The samples collected from Grid No. 79 in the South Drum Storage Pad showed 6 ppb of MIBK (which is equivalent to the method detection limit for the compound) at the 6"-12" depth, but no detectable VOCs at the 12" 24" depth. The 12" 24" depth sample from Grid 100 in the South Drum Storage Pad area showed detectable levels of methylene chloride.
- The 12"-24" depth samples from grids 24 and 45 in the Former Liquid Incinerator area showed detectable levels of methylene chloride.

Of the methylene chloride detected in three of the samples obtained during this sampling effort, Table 4-1 shows that the levels detected are at least an order of magnitude lower than the methylene chloride in 6"-12" samples from the same grid locations collected in 1989. These results suggest that higher concentrations at intervals deeper than 12"-24" are unlikely.

TABLE 4-1 METHYLENE CHLORIDE DATA SUMMARY

(All Concentrations in μg/kg)

Sampling Interval	Liquid I	ncinerator	South Drum Storage Pad
	Grid 24	Grid 45	Grid 100
6"-12" Interval (1989)	4,000	400	300
12"-24" Interval (1992)	21	13	31

Based on the analytical results reduced from this recent sampling event, the lateral extent of contamination within each of the three closure areas, (Former Liquid Incinerator Pad, West and South Drum Storage Pads) has been adequately defined. None of the chemicals of concern observed in the previous sampling event were observed in the current sampling event with the exception of methylene chloride and the data indicate that methylene chloride does not increase in concentration with depth. Furthermore, methylene chloride was only observed within the previously sampled grids.

The data obtained from this latest round of sampling will be incorporated into the existing data base for each unit to calculate site risks. Although PPG believes that Ohio EPA's guidance on risk-based RCRA unit closure is based on extremely conservative exposure scenarios, the guidance will be utilized to demonstrate that acceptable levels of risk are present at the three interim status hazardous waste management units and conditions are acceptable for closure.

Attachment C 04512-03-A

Revision: 3 Date: June 24, 1993

#### APPENDIX A

### ADDITIONAL SAMPLING PROGRAM CORRESPONDENCE

Attachment C 04512-03-A Revision: 3 Date: June 24, 1993 Central District Office

Street Address: 2305 Westbrooke Drive, Building C Columbus, Ohio 43228 614-771-7505 FAX 614-771-7571 Mailing Address: P.O. Box 2198 Columbus, Ohio 43266-2198

George V. Voinovich Governor Donald R. Schregardus Director

August 31, 1992

RE: Closure Appeal Settlement, Partial Closure Plan Three drum storage areas and liquid waste incinerator OHD 004 304 689/01-65-0063

Mr. Larry LaDage Plant Manager PPG Industries, Incorporated P.O. Box 457 Circleville, Ohio 43113

Dear Mr. LaDage:

The Ohio EPA has reviewed PPG Industries' July 27, 1992 and subsequent August 7, 1992 proposals for revising the partial closure plan for the three drum storage areas and the old liquid waste incinerator site. With the changes included from the August 7, 1992 revision, the Ohio EPA finds the proposed sampling plan acceptable and approves its implementation. Please contact me prior to the start of sampling so that I may be present to observe operations and procedures. Results from the sample analysis should be submitted to this office for review and evaluation as to whether the full extent of both vertical and horizontal contamination has been determined.

If you have any questions or require further information, please feel free to contact either myself at (614) 771-7505 or Sandra Leibfritz at (614) 644-2956.

Sincerely,

John Paulian

Division of Hazardous Waste Management

Central District Office

JP/sc

cc: Chris Korleski, AGO Sandra Leibfritz, DHWM, CO Bryant Riley, PPG



### PPG Industries, Inc. Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

August 7, 1992

Mr. John Paulain Ohio EPA Central District Office Division of Hazardous Waste Management 2305 Westbrooke Drive, Building C Columbus, Ohio 43228

Re: Closure Plan

Three Drum Storage Areas & Liquid Incinerator

OHD004304689

Dear John:

In reference to our discussion during your site visit on Tuesday, August 4, PPG Industries amends the following item in our July 27, 1992 letter regarding the Partial Closure at the Circleville, Ohio facility:

#### Item 3. Additional Sampling:

a. INCINERATOR AREA: In order to further define the extent of contamination as determined by the previous round of sampling, additional sampling grids are added to the western boundary of the existing incinerator area grid (see attached Figure 1 Revision 1.0). Using the biased sampling approach, an additional sample will be obtained from grid 113. Sampling method and analytical protocol will be the same as described in the proposal of July 27.

Please feel free to call if you have any questions.

Sincerely yours,

Bryant Riley

cc: M. Broz, PPG

J. Karas, PPG

C. Waterman, Bricker & Eckler

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FIGURE 1 Rev. 1.0 (8/5/92)

SOIL SAMPLING GRID; INCINERATOR AREA



### PPG Industries, Inc. Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

July 27, 1992

Mr. John Paulian OhioEPA Central District Office Division of Hazardous Waste Management 2305 Westbrooke Dive, Building C Columbus, Ohio 43228

Re: Closure Plan

Three Drum Storage Areas & Liquid Incinerator

OHD 004 304 689

Dear Mr. Paulian:

This letter is being provided in response to the letter from you dated June 1, 1992 regarding the Partial Closure Plan for three drum storage areas and the liquid incinerator at PPG Industries, Inc. (PPG) facility in Circleville, Ohio. We offer the following responses to the items in that letter:

#### Item 1. PCB Contamination:

Documentation that PCB levels recorded in the south pad soils and in the incinerator soils are unrelated to RCRA activities will be included in the revised Partial Closure Plan. The Partial Closure Plan will be revised to reflect the approved responses to OEPA comments after OEPA concurrence with the contents of this letter.

#### Item 2. Corrective action levels:

We acknowledge your response to this item.

#### Item 3. Additional Sampling:

a. INCINERATOR AREA: PPG proposes to use already established sampling grids 34-36, 45-47 and 56-58 to further characterize soils to the north and west of the old incinerator (See attached Figure 1). A biased sampling approach will be used and soil samples will be obtained from grids 34, 36 and 56. Samples from these grids will be taken at depths of 6-12 inches and 12-24

inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 24 and 45 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination. (Note that, as indicated in Figure 1, a stairway is presently located in a portion of Grid 24.)

WEST PAD AREA: PPG proposes to use 16 new sampling grids (45 to 60) along the north and western boundaries of the existing grid to further characterize soils to the north and west of the west pad area (See attached Figure 2). A biased sampling approach will be used and soil samples will be obtained from grids 45, 51, 56 and 60. from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch Samples will also be taken beneath previously sampled grids 6 and 44 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

SOUTH PAD AREA: A truck parking pad (concrete slab) is located directly adjacent and west of the existing grid system for the South Pad. For this reason, PPG proposes to use 5 existing grids which were not previously sampled (53, 66, 79, 92 and 105) as well as 11 new sampling grids (144 to 154) to further characterize soils to the southwest of the pad (See attached Figure 3). grids will include a one grid extension to the west of grids 118 and 131 and a one grid extension south of grids 131 through 138. A biased sampling approach will be used and soil samples will be obtained from grids 79, 146, and Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, detected at the 6-12 inch depth. A sample will also be taken beneath previously sampled grid 100 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

The analysis of the samples will be performed using SW-846, Method 8240. Samples will be collected by advancing

a hand or power auger to the specified depth and then collecting the sample in a soil probe.

- b. See proposed sampling for extent of vertical contamination under a. above.
- c. If the results of the additional sampling program proposed under a. above do not result in a clear demarcation of the RCRA units of concern subject to closure activities, then PPG will provide information concerning past site operations and management practices.
- d. We acknowledge your comment on this item.
- e. We acknowledge your comment on this item.

PPG is requesting a response to this letter within two (2) weeks of its receipt so that sampling activities can be initiated in an expeditious manner. Note that we will inform you prior to the actual start of the sampling program so that you may be present to observe the sampling activities.

After the contents of this letter are approved and the additional sampling is completed, PPG intends to modify the Partial Closure Plan to reflect the approved responses and sampling results.

Please feel free to call if you have any questions.

Sincerely,

Larry LaDage Plant Manager

cc: M. Broz, PPG/file CR 310 (1992)

I W Weder for L. La Ouge

J. Karas, PPG

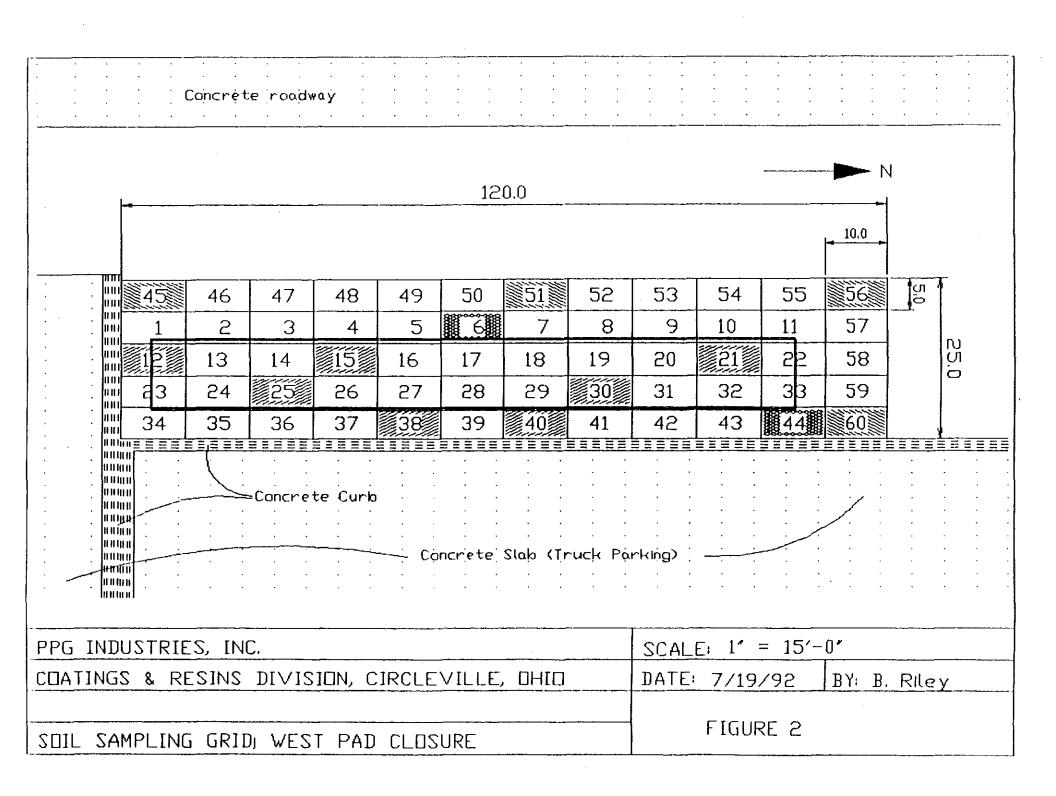
B. Riley, PPG

C. Waterman, Bricker & Eckler

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SOIL SAMPLING GRID; INCINERATOR AREA

FIGURE 1



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### APPENDIX B

### LABORATORY RAW DATA

Revision: 3 Date: June 24, 1993

### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Project: PPG RUSH SOIL VOAs

09/30/1992

NET Job Number: 92.34112

National Environmental Testing

NET Atlantic, Inc. Cambridge Division 12 Oák Park Bedford, MA 01730



### **NET Cambridge Division**

#### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222 Reported By:

National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 09/30/1992

Collected By: ICF

NET Job Number: 92.34112

Project: PPG RUSH SOIL VOAs

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs

Airbill No: 4450798251

NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the MET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler NET Project Manager Michael F. Delaney, Ph.D. Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE	NET	DATE	TIME	DATE	
ID	ID	TAKEN	TAKEN	REC'D	MATRIX
cv-92-350-s79	67046	09/23/1992	16:45	09/24/1992	SOIL
CV-92-354-\$152	67047	09/23/1992	17:10	09/24/1992	SOIL
cv-92-340-W45	67048	09/23/1992	13:38	09/24/1992	SOIL
cv-92-342-V51	67049	09/23/1992	10:50	09/24/1992	<b>S</b> 01L
CV-92-344-W56	67050	09/23/1992	12:19	09/24/1992	SOIL
CV-92-346-W60	67051	09/23/1992	12:50	09/24/1992	SOIL
CV-92-347-W60A	67052	09/23/1992	13:10	09/24/1992	SOIL
CV-92-351-FBW	67053	09/23/1992	13:10	09/24/1992	BLANK
CV-92-330-134	67138	09/24/1992	09:06	09/25/1992	SOIL
CV-92-332-136	67139	09/24/1992	09:32	09/25/1992	SOIL
CV-92-334-156	67140	09/24/1992	08:30	09/25/1992	SOIL
cv-92-336-1113	67141	09/24/1992	08:30	09/25/1992	SOIL
CV-92-358-FBI	67142	09/24/1992	10:15	09/25/1992	BLANK
cv-92-360-\$146	67143	09/24/1992	11:20	09/25/1992	SOIL



Report Date: 09/30/1992

Report To: ICF Kmiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-350-S79

			Analysis	
Parameter	Result	Units	Date	Analys
TCL Volatiles by GC/MS 8240 S		*****		
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		·
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	6	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachioroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-354-S152

			Analysis			
Parameter	Result	Units	Date	Analyst		
TCL Volatiles by GC/MS 8240 S						
Acetone	<6.0	ug/Kg	09/25/1992	dry		
Benzene	<6.0	ug/Kg	07, 23, 1772	٠,		
Bromodichloromethane	<b>46.0</b>	ug/Kg				
Bromoform	≪6.0	ug/Kg				
Bromomethane	<6.0	ug/Kg				
2-Butanone (MEK)	≪6.0	ug/Kg				
Carbon Disulfide	<6.0	ug/Kg				
Carbon Tetrachloride	<6.0	ug/Kg				
Chlorobenzene	<6.0	ug/Kg				
Chloroethane	<6.0	ug/Kg				
2-Chloroethylvinyl ether	<6.0	ug/Kg				
Chloroform	<6.0	ug/Kg				
Chloromethane	<6.0	ug/Kg				
Dibromochioromethane	<6.0	ug/Kg				
1.2-Dichtorobenzene	<6.0	ug/Kg				
1,3-Dichlorobenzene	<6.0	ug/Kg				
1,4-Dichlorobenzene	<6.0	ug/Kg				
1,1-Dichloroethane	<6.0	ug/Kg				
1,2-Dichloroethane	<6.0	ug/Kg				
1,1-Dichloroethene	<6.0	ug/Kg				
trans-1,2-Dichloroethene	<6.0	ug/Kg				
1,2-Dichloropropane	<6.0	ug/Kg				
cis-1,3-Dichloropropene	<6.0	Ug/Kg				
trans-1,3-Dichloropropene	<6.0	ug/Kg				
Ethylbenzene	<6.0	ug/Kg				
2-Hexanone	<6.0	ug/Kg				
i-Methyl-2-pentanone (MIBK	<6.0	ug/Kg				
Methylene Chloride	<6.0	ug/Kg				
Styrene	<6.0	ug/Kg				
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg				
Tetrachioroethene	<6.0	ug/Kg				
Toluene	<6.0	ug/Kg				
1,1,1-Trichloroethane	<6.0	ug/Kg				
1,1,2-Trichloroethane	<6.0	ug/Kg				
Trichloroethene	<6.0	ug/Kg				
Trichlorofluoromethane	<6.0	ug/Kg				
Vinyl Acetate	<6.0	ug/Kg				
Vinyl Chloride	<6.0	ug/Kg				
m-Xylene	<6.0	ug/Kg				
o-Xylene	<6.0	ug/Kg				
p-Xylene	<6.0	ug/Kg				



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-340-845

			Analysis	
Parameter	Result	Units	Date	Analyst
The 11 1 421 - by 00 00 00/0 0				
TCL Volatiles by GC/MS 8240 S	<6.0	(M.a.	09/25/1992	dry
Acetone Benzene	<6.0 <6.0	ug/Kg	09/23/1992	ury
penzene Bromodichloromethane	<b>46.0</b>	ug/Kg		
sromodiciloromethane Bromoform	₹6.0 ₹6.0	ug/Kg		
Promotorii Promomethane	<b>₹6.0</b>	ug/Kg ug/Kg		
Promomethane 2-Butanone (MEK)	<b>46.0</b>	ug/Kg		
Carbon Disulfide	<b>46.0</b>	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chioroethane	<b>₹6.0</b>	ug/Kg		
2-Chloroethylvinyl ether	≪6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	≪6.0	ug/Kg		
) i bromoch i oromethane	<6.0	ug/Kg		
1.2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
sis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	≪6.0	ug/Kg		
-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Foluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1.1.2-Trichloroethane	<6.0	ug/Kg		
Frichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
/inyl Acetate	<6.0	ug/Kg		
/inyl Chloride	<6.0	ug/Kg		
a-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-342-W51

			Analysis	
Parameter	Result	Units	Date	Analyst
***********************				
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichioromethane	<6.0	ug/Kg		
Bromoform	≪6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Bisulfide	<6.0	ug/Kg		
Carbon Tetrachloride	≪6.0	ug/Kg		
Chlorobenzene	≪6.0	ug/Kg		
Chloroethane	<b>&lt;6.</b> 0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	≪6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	≪6.0	ug/Kg		
1,2-Dichlorobenzene	≪6.0	ug/Kg		
1,3-Dichtorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	≪6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg	•	
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<b>&lt;</b> 6.0	ug/Kg		
1,1,2-Trichloroethane	<b>&lt;6.0</b>	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		



Report Date: 09/30/1992

Report To: 1CF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-344-W56

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S			<b></b>	
Acetone	⋖5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	⋖5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chiorobenzene	<5.0	ug/Kg		
Chloroethane	⋖.0	ug/Kg		
2-Chloroethylvinyl ether	⋖.0	ug/Kg	*	
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	⋖5.0	ug/Kg		
1,2-Dichiorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	⋖5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichtoropropane	⋖5.0	ug/Kg		
cis-1,3-Dichtoropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chioride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyi Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-346-W60

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	≪6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	⋖6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	⋖6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	⋖6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachioroethene	⋖6.0	ug/Kg		
Taluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	⋖6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichiorofiuoromethane	<6.0	ug/Kg		
Vinyl Acetate	⋖6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
•	<6.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-347-W60A

			Analysis		
Parameter	Result	Units	Date	Analys	
TCL Volatiles by GC/MS 8240 S					
Acetone	<5.0	ug/Kg	09/25/1992	dry	
Benzene	<5.0	ug/Kg			
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chilorobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg			
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	⋖5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	⋖.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg	•		
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
?-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg			
Methylene Chloride	<5.0	⊔g/Kg			
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1.2-Trichloroethane	<5.0	ug/Kg			
Trichloroethene	<5.0	ug/Kg			
Frichiorofiuoromethane	<5.0	ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0	ug/Kg			
p-Xylene	<5.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-FBW

Parameter	Result	Units	Date	Analysi
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	09/30/1992	<b>ef</b> u
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	Ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1.1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers MET Job No: 92.34112

Project: PPG RUSH SOIL VOAs Date Rec'd: 09/25/1992

Sample ID: CV-92-330-134

			Analysis		
Parameter	Result	Units	Date	Analys	
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	09/29/1992	dry	
Benzene	<6.0	ug/Kg			
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<b>&lt;</b> 6.0	ug/Kg			
Bromomethane	<6.0	ug/Kg			
2-Butanone (MEK)	<b>&lt;</b> 6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	⋖6.0	ug/Kg			
is-1,3-Dichloropropene	<6.0	ug/Kg			
rans-1,3-Dichloropropene	<6.0	ug/Kg			
thylbenzene	<6.0	ug/Kg			
-Hexanone	<6.0	ug/Kg			
i-Methyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
foluene	<6.0	ug/Kg			
I,1,1-Trichioroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<6.0	ug/Kg			
richloroethene	<6.0	ug/Kg			
richlorofluoromethane	₹6.0	ug/Kg			
/inyl Acetate	<6.0	ug/Kg			
/inyl Chloride	<6.0	ug/Kg			
r-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-332-I36

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S			00 (00 (4000	<b>4</b>	
Acetone	<6.0 -(.0	ug/Kg	09/29/1992	dry	
Benzene	<6.0	ug/Kg			
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			
Bromomethane	<6.0 <6.0	ug/Kg			
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachtoride	<6.0	ug/Kg			
Chlorobenzene		ug/Kg			
Chloroethane	<6.0 <6.0	ug/Kg			
2-Chloroethylvinyl ether	=	ug/Kg			
Chloroform	<b>&lt;6.0</b>	ug/Kg			
Chloromethane	<6.0 <6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<b>₹6.</b> 0	ug/Kg			
1,3-Dichtorobenzene	<b>46.0</b>	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<b>46.0</b>	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Hexanone	<b>46.0</b>	ug/Kg			
4-Methyl-2-pentanone (MIBK Methylene Chloride	<b>&lt;6.0</b>	ug/Kg ug/Kg			
,	<6.0	ug/Kg			
Styrene 1.1.2.2-Tetrachloroethane	<6.0	ug/Kg ug/Kg			
	<b>46.</b> 0				
Tetrachloroethene Toluene	<6.0	ug/Kg ug/Kg			
	<b>46.0</b>	ug/kg ug/Kg			
1,1,1-Trichloroethane	<b>46.</b> 0	ug/kg ug/Kg			
1,1,2-Trichloroethane Trichloroethane	<6.0	ug/kg ug/kg			
Trichlorofiluoromethane	<b>46.0</b>	ug/kg ug/Kg			
	٠٥.0 ح6.0	ug/kg ug/kg			
Vinyl Acetate	<6.0	ug/kg ug/Kg			
Vinyl Chloride	<b>46.</b> 0				
m-Xylene	<b>≪</b> 6.0	ug/Kg			
o-Xylene		ug/Kg			
p-Xylene	<b>&lt;6.0</b>	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-334-156

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	≪6.0	ug/Kg	09/29/1992	dry
Benzene	≪6.0	ug/Kg	,	- ,
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Ch Lorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochioromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichtorobenzene	<b>&lt;6.</b> 0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<b>&lt;6.0</b>	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
- 4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	₹6.0	ug/Kg		
Tetrachioroethene	<6.0	ug/Kg		
Toluene	<6.D	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1.1.2-Trichloroethane	<6.0	ug/Kg		
Trichioroethene	⋖6.0	ug/Kg		
Trichiorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	Ug/Kg		
Vinyl Chioride	≪6.0	ug/Kg		
m-Xylene	≪6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	≪6.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-336-I113

			Analysis	
Parameter	Result	Units	Date	Anslyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/29/1992	dry
Benzene	<5.0	ug/Kg	07, 27, 1772	٠.,
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachioroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	· <5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichioroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-358-FBI

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 624 AQ	****				
Acetone	<5.0	ug/L	09/29/1992	edl	
Benzene	<5.0 <5.0	ug/L	07/27/1772		
Bromodichloromethane	<5.0	ug/L			
Bromoform	<5.0	ug/L			
Bromomethane	<5.0	ug/L			
2-Butanone (MEK)	<5.0	ug/L			
Carbon Disulfide	<5.0	ug/L			
Carbon Tetrachloride	<5.0	ug/L			
Chlorobenzene	<5.0	ug/L			
Chloroethane	<5.0	ug/L			
2-Chloroethylvinyl ether	<5.0	ug/L			
Chloroform	⋖5.0	ug/L			
Chloromethane	<5.0	ug/L			
Dibromochloromethane	<5.0	ug/L			
1,2-Dichlorobenzene	<5.0	ug/L			
1,3-Dichlorobenzene	<5.0	ug/L			
1,4-Dichlorobenzene	<5.0	ug/L			
1,1-Dichloroethane	<5.0	ug/L			
1,2-Dichloroethane	<5.0	ug/L			
1,1-Dichloroethene	<5.0	ug/L			
trans-1,2-Dichloroethene	<5.0	ug/L			
1,2-Dichloropropene	<5.0	ug/L			
cis-1,3-Dichloropropene	<5.0	ug/L			
trans-1,3-Dichloropropene	<5.0	ug/L			
Ethylbenzene	<5.0	ug/L			
2-Hexanone	<5.0	ug/L			
4-Methyl-2-pentanone (MIBK	<5.0	ug/L			
Methylene Chloride	<5.0	ug/L			
Styrene	<5.0	ug/L			
1,1,2,2-Tetrachioroethane	<5.0	ug/L			
Tetrachloroethene	<5.0	ug/L			
Toluene	<5.0	ug/L			
1,1,1-Trichloroethane	<\$.0	ug/L	4		
1,1,2-Trichtoroethane	<5.0	ug/L			
Trichloroethene	<5.0	ug/L			
Trichlorofluoromethane	<5.0	ug/L			
Vinyl Acetate	<5.0	ug/L			
Vinyl Chloride	<5.0	ug/L			
a-Xylene	<5.0	ug/L			
o-Xylene	<5.0	ug/L			
p-Xylene	<5.0	ug/L			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-360-\$146

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S		******			
Acetone	<5.0	ug/Kg	09/29/1992	drγ	
Benzene	<5.0	ug/Kg	,,	,	
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	⋖5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chil orobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg			
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	<5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1.1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	⋖5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg			
Methylene Chloride	<5.0	ug/Kg			
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1,2-Trichloroethane	<5.0	ug/Kg			
Trichloroethene	<5.0	ug/Kg			
	<5.0	ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0	ug/Kg			
p-Xylene	<\$.0	ug/Kg			



### **NET Cambridge Division**

### QUALITY CONTROL DATA

Client: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Report Date: 09/30/1992

### Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

\$\$1 \$\$2 \$\$3 \$\$4 \$\$5 \$\$6 \$\$7 \$\$8 \$\$9 \$\$10 \$\$11 \$\$12

Bromofl 1,2-Dic Toluene Bromofl 1,2-Dic Toluene

						Perce	ent Reco	very						
Sample ID	NET I	D Matrix	SS1	SS2	\$\$3	SS4	\$85	SS6	SS7	888	\$\$9	<b>SS10</b>	<b>SS11</b>	<b>SS12</b>
cv-92-350-s79	67046	SOIL				87	83	107		******				
CV-92-354-\$152	67047	SOIL				80	76	117						
CV-92-340-W45	67048	SOIL				95	88	112						
CV-92-342-W51	67049	SOIL				87	84	128						
CV-92-344-W56	67050	SOIL				75	76	109						
CV-92-346-W60	67051	SOIL				78	74	107						
CV-92-347-W60A	67052	SOIL				94	91	126						
CV-92-351-F8W	67053	BLANK	104	99	106									
CV-92-330-134	67138	SOIL				87	84	107						
CV-92-332-136	67139	SOIL				81	83	109						
CV-92-334-156	67140	SOIL				82	82	105						
CY-92-336-1113	67141	SOIL				85	78	104						
CV-92-358-FBI	67142	BLANK	101	100	106									
CV-92-360-\$146	67143	SOIL				87	82	102						

Notes:

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.

Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:

Decachl = Decachlorobiphenyl Dibutyl = Dibutylchlorendate Te

Tetrach = Tetrachloro-m-xylene

Volatile Surrogate Standards:

#ramofl = Bramofluorobenzene 1,2-Dichl = 1,2-Dichloroethane-d4 Toluene = Toluene = Toluene

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

<u>Semivolatiile Surrogate Standards:</u>

2-Fluor (1st) = 2-Fluorobiphenyl Phenol- = Phenol-d6

2-Fluor (2nd) = 2-Fluorophenol Nitrobe = Nitrobenzene-d5

2,4,6-T = 2,4,6-Tribromophenul p-Terph = p-Terphenyl\_\_\_\_

Herbicides Surrogate Standard:

2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:

2-Fluor = 2-Fluorobiphenyl

para-Te = para-Terphynyl

### NET ATTANTIC INC CAMPRIDGE DIVISION

ANALYST: JP INSTRUMENT: HP5970 DATE/TIME: 920825 11:46 BLANK FILE: >H4112 MATRIX: SOIL AQUEDUS MEDIUM LEVEL REPORTING LIMIT RESULT TEST COMPOUND NAME **Q**6/K6 U6/L U6/K6 U6/L 5 56644 CHLOROMETHANE ND 5 55628 BROMOMETHANE 5 56652 VINYL CHLORIDE 5 56638 CHLORGETHANE TRICHLOROFLUOROMETHANE 5 55688 METHYLENE CHLORIDE 5 58672 56520 ACETONE 5 5 CARBON DISULFIDE 56632 1,1-DICHLORDETHANE 5 56652 1.1-DICHLOROETHENE 5 56556 5 trans-1,2-DICHLOROETHENE 55658 5 cis-1,2-DICHLOROETHENE 56542 CHLOROFORM 5 5 55554 1,2-DICHLOROETHANE 55650 Z-BUTANONE (MEK) 5, 1,1,1-TRICHLOROETHANE 55592 5 5 58634 CARBON TETRACHLORIDE 55690 **UINYL ACETATE** 5 **BROMODICHLORDMETHANE** 5 56624 5 55660 1,2-DICHLOROFROPANE TRICHLORDETHENE 56555 DIBROMOCHLOPOMETHANE 5 5664E 55554 1,1,2-TRICHLORGETHANE 5 55522 BENZENE 5 trans-1,3-DICHLOROPROPENE 5 55664 cis-1,3-DICHLOROPROPENE 5 5E 5 4 Ø 2-CHLORGETHYLUINYL ETHER 5 55626 BROMOFORM 5 4-METHYL-2-FENTANONE 5 56570 I-HEXANONE 5 56658 **55578** TETRACHLOFGETHENE 5 56676 1,1,2,2-TETRACHLORGETHANE 5 56560 TOLUENE 5 5563E CHLOROSENZENE 5 56556 ÉTHYLBENZENE 5 56674 STYRENE 5 56634 m-X7LENE 5 56898 5 o-XYLENE 56697 5 p-XYLENE 5 TOTAL XYLENES 55546 1,2-DICHLOROBENZENE 5 55550 5 1,3-DICHLOROBENZENE 1,4-DICHLOROBENZENE 5 SUPROSATE COMPOUND RECOVERIES SOIL LIMITS AQUEDUS LINITS 551 D4-DICHLOROETHANE 90 70-1212 76-1142 982 DE-TOLUENE 84-138% 103 86-1107

95

59-1137

85-115%

983 BROMOFLUOROBENZENE



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86-11 86-11 86-11
INSTRUMENT:HPS



## NET ATLANTIC, INC CAMBRIDGE DIVISION - DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 12:32

SSO DAHTOLUENE

FF3 FF000FL00F0RENZEGE

ANALYST:JIM

INSTRUMENT: HP5970

BLANK FILE: >E0178

MATRIX:	SDIL AQUEOUS >	MEDIUM LEVEL	<b>-</b>
		RESULT	REPORTING LIMIT
TEST	COMPOUND NAME	(UG/L) UG/KG	UG/L UG/KG
56644	CHLOROMETHANE	****	5
56628	BROMOMETHANE		5
56692	VINYL CHLORIDE		5
56638	CHLORGETHANE		5
56688	TRICHLOROFLUOROMETHANE		5
56672	METHYLENE CHLORIDE		5
5662Û	ACETONE .		5
56632	CARBON DISULFIDE		5
56652	1,1-DICHLORGETHANE		5
56556	1,1-DICHLORGETHENE		5
56658	trans-1,2-DICHLOROETHENE		5
	cis-1,2-DICHLOROETHENE		5
56642	CHLOROFORM		5
56554	1,2-DICHLOPGETHANE		5
56630	2-BUTANONE (MEK)		5
<u>56692</u>	1,1.1-TR CHLORGETHANE		5
56434	CARBON TETRACHLORIDE		5
é∸⊆0	MINYL ACETATE		2
26624	BROMODICHLOROMETHANE		5
წლიდე	1,2-D)CHLOSOPROPANE		5
<del>5</del> 6686	TRICHLORDETHENE		5
5్కచర	D18ROMOCHLOROMETHANE		F
56684	1.1,2-TRICHLOROETHANE		5
56632	BENZERE	1	5
56664	trans-1,3-DICHLOROPROPEN		5
	cis-1,3-DICHLOROPROPENE		5
5c640	2-CHLOPOETHYLUINYL ETHER		5
564?6	FACHORDER		5
56670	4-METHYL-2-PENTANONE		<u>চ</u>
<u>్రాలు</u>	2-HEMARK RE		묫
통료를 7명	TETRACHLOROETHENE		5
$\mathbb{F}_{\mathfrak{S}}$	1.1.2,2-TETRACHLORDETHANE	<u> </u>	5
56580	TOLUENE		5
566ే6	CHECHPENZEME		5
56666	ETHYLEENZENE		চ চ হ
56674	STYRENE		5
56694	m-XYLENE		
56696	○一次人厂EVE		5
56697	p-XYLENE		5
_	TOTAL XYLERES		5 5 5
56648	1.2-DICHLOROBENZENE		5
5 <u>6</u> 656	1,3-DICHLOROBENZENE		
566F1	1,4-D1CHLOROBENZENE	• • • • •	5 11
506R06#1	TE COMPOUND RECOVERIES	% SOIL LIMITS	AQUEQUS L Z
	MICHLORDETHARE	99 70-121%	

- 104

101

84-138%

59-117%

88-116%

86-115%

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DATE/TIME:920929 16:45

ANALYST:JIM

INSTRUMENT: HP5970

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		/ 1	SULT	REPORTING LIMI
TEST	COMPOUND NAME	(UG/L)	U6/K6	UG/L UG/KG
56644	CHLOROMETHANE	, , ,	NP	5
56628	BROMOMETHANE			. 5
56592	VINYL CHLORIDE			5
56538	CHLOROETHANE			5
55588	TRICHLOROFLUOROMETHANE			5
56672	METHYLENE CHLORIDE			5
56820	ACETONE		,	5
56532	CARBON DISULFIDE		.,.	5
56652	1,1-DICHLOROETHANE		\	5
56656	1,1-DICHLOROETHENE			5
56558	trans-1,2-DICHLORGETHENE			5
20000	cis-1,2-DICHLOROETHENE	• • • •	```	5
56642	CHLOROFORM			5
56554	1,2-DICHLOROETHANE	• • •		5 5
56630	2-BUTANONE (MEK)		***	D #3
56682			•••	5 5
	1,1,1-TRICHLORGETHANE	• • • •	• • •	<b>5</b>
56634	CARBON TETRACHLORIDE	• • •	• • •	
56590	VINYL ACETATE		• • •	5
56624	BROMODICHLOROMETHANE		• • •	5
56666	1,Z-DICHLÖROPROPANE			5
5568£	TRICHLOROETHENE			5 5 5
55646	DIPPOMOCHLOROMETHANE			5
56534	1,1,2-TRICHLOROETHANE			5
58822	BENZENE			5
55554	trans-1,3-DJCHLOROPROPEN	·		5 5
	cis-1,3-DICHLOROPROPENE			5
56640	2-CHLORGETHYLVINYL ETHER			5
56625	BROMOFORM			5
55570	4-METHYL-2-PENTANONE			5 -
56565	2 -HEXANONE			5
56578	TETRACHLORDETHENE			5
56676	1,1,2,2-TETRACHLORGETHAN	Ξ		5
56680	TOLUENE			5
56636	CHLOPOBENZENE			5
5 <b>6</b> 555	ETHYLBENZENE	• • •	•••	5
56E74	STYRENE		• • •	5
55694	m-YYLENE	• • •	• • • •	5
56696	o-xylene		* • • •	5
56697			• • •	5 5
2003/	PHNYLENE		• • •	
EED 40	TOTAL XYLENES		• • •	5
56548 5557	1,I-DICHLOROBENZENE		• • •	5
56650	1,3-DICHLOROBENZENE		•••	5
56651 	1,4-DICHLOROBENZENE		¥ 	5
SURROGAT	E COMPOUND PECOVEPIES	%	SOIL LIMIT	S AQUEOUS LIMITS
SS1 D4-D	ICHLORGETHANE	99	70-121%	75-114%
952 D8-T	OLUENE	102	84-138%	88-110%
CC7 5-54	OFLUOROBENZENE	97	59-113%	86-115%



### NET BILANTIC INC - CAMERIDGE DIVISION

ANALYST: JP INSTRUMENT: HP5970 DATE/TIME: 920929 16:01 BLANK FILE: >H4148 AQUEOUS -MEDIUM LEVEL REPORTING LIMIT RESULT Ø6/K6 **TEST** COMPOUND NAME U6/L US/L **U6/K6** 5 55544 CHLOROMETHANE 5 55628 BROMOMETHANE 5 UINYL CHLORIDE 55692 5 CHLOROETHANE 56638 TRICHLOROFLUOROMETHANE 5 56666 5 56677 METHYLENE CHLORIDE 5 ACETORE 56620 5 56632 CARBON DISULFIDE 1.1-DICHLOROETHANE 5 56652 5 1.1-DICHLOROETHENE 56655 5 trans-1,2-DICHLORDETHENE 56658 cis-1,2-DICHLOROETHENE 58542 CHLORDFORM 5 5 55554 1,2-DICHLORGETHANE 5 2-BUTANONE (MEK) 56530 5 56682 1,1,1-TRICHLDROETHANE 5 CARBON TETRACHLORIDE 566.54 56898 **UINYL ACETATE** 5 5 BROMODICHLOROMETHANE 55524 5 55550 1,2-DICHLOROPROPANE 5 55686 TRICHLORDETHENE DIBROMOCHLOROMETHANE 5 56E46 5 55554 1.1.2-TRICHLORGETHANE 56612 5 BENZENE 5 trans-1,3-010HLDRDPROPENE 55554 5 c:s-1,3-DICHLORGPROPENE 5 55540 2-CHLOROETHYLVINYL ETHER 5 55525 **EROMOFORM** 4-METHYL-2-PENTANONE 5 55676 2-HEXANONE 5 55656 5 55278 TETRACHLOROETHERE 55575 1,1,2,2-TETRACHLORGETHANE 5 5 TOLUENE 56660 5 55635 CHLOROBENIENE ETHYLBENZENE 56666 5 55574 STYRENE 5 55594 m-XYLENE 5 C-XYLENE 56696 5 58E 97 p-XYLENE TOTAL XYLENES 5 1,2-DICHLORGEENZENE 5 55546 1.3-DICHLOROBENZENE 5 55650 1.4-DICHLOROSENZENE SURROGATE COMPOUND RECOVERIES SOIL LIMITS AQUEOUS LIMITS

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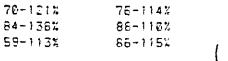
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SS1 D4-DICHLORDETHANE

SS3 BROMOFLUOROBENZENE

552 DB-TOLUENE





### NET ATLANTIC, INC\_ CAMBRIDGE DIVISION — DATA WORKSHEET METHOD BLANK

ANALYST: JP INSTRUMENT: HP5970 DATE/TIME: 920929 23:40 BLANK FILE: >H4149 HOUEDUS MEDIUM LEVEL RESULT REPORTING LIMIT COMPOUND NAME U6/L U6/K6 U6/L U5/K6 TEST 5 CHLOROMETHANE ND 58544 5 55628 BROMOMETHANE VINYL CHLORIDE 5 566 92 5 <del>-566</del>36 CHLORGETHANE TRICHLOROFLUDROMETHANE 5 55652 METHYLENE CHLORIDE 5 55672 58820 ACETONE 5 5 55632 CARBON DISULFIDE 1.1-DICHLORGETHANE 56852 5 5 1.1-DICHLOROETHENE 56656 5 trans-1,2-DICHLORGETHENE 56658 cis-1,2~DICHLORDETHENE 5 5 58642 CHLOROFORM 1,2-DICHLOROETHANE 55554 5 5 2-BUTANONE (MEK) 56630 5 1.1.1-TRICHLOROETHANE 56662 5 56634 CARBON TETRACHLORIDE VINYL ACETATE 5 56690 BROMODICHLOROMETHANE 5 55524 5666@ 1,2-DICHLOROPROPANE 5 5 56565 TRICHLORGETHENE DIBROMOCHLOROMETHANE 5 55546 5 56564 1,1,2-TRICHLORDETHANE 55522 BENZENE 5 trans-1,3-DICHLOROPRGFENE 5 58554 cis-1,3-DICHLOROPROPENE 5 5 56540 2-CHLOROETHYLVINYL ETHER 5 56626 BROMOFORM 56676 4-METHYL-Z-PENTANONE 5 2-HEXANDNE 5 58888 5 55578 TETRACHLORGETHENE 1,1,2,2-TETRACHLOFOETHAME 5 55676 TOLUENE 5 56560 CHLOROBENZENE Ξ 56636 ETHYLBENZENE 5 55555 55574 STYRENE m-XYLENE 5 55534 56696 o-XYLENE 5 5 55597 p-XYLENE TOTAL XYLENES 5 55548 1.2-DICHLOROBENZENE 5 1,3-DICHLORDBENIENE 58550 1,4-DICHLOROBENZENE 56651 SURROGATE COMPOUND RECOVERIES SOIL LIMITS AQUEDUS LIMITS X

73

103

54

70-121%

84-136%

59-113%

75-114%

88-116%

85-115%

53) D4-DICHLOROETHANE

SS3 EROMOFLUOROBENZENE

SS2 D6-TOLUENE



### NET ATLANTIC, INC. CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME:920930 10:19 ANALYST: MARK INSTRUMENT: HP59 70 BLANK FIFE: >G8038 MATRIX: SOIL AQUEOUS MEDIUM LEVEL REPORTING LIMIT RESULT TEST COMPOUND NAME UG/L UG/KG UG/L UGZKG 56644 CHLOROMETHANE 5 56628 5 BROMOMETHANE 56692 5 VINYL CHLORIDE 5 56638 CHLORDETHANE 56688 TRICHLOROFLUGROMETHANE 5 56672 5 METHYLENE CHLORIDE 56628 ACETONE 5 56632 CARSON DISULFIDE 56652 1,1-DICHLOROETHANE 5 <u>ნგგნნ</u> 1,1-DICHLORDETHENE 56658 trans-1,2-DICHLOROETHENE 5 cis-1,2-D1CHLOROETHENE 5 56642 CHLOROFORM 5 156654 1.2-51CHLORGETHANE 56630 2-BUTANONE (MEK) 5 56682 1.1.1-TRICHLORDETHAME 56634 CARBON TETRACHLORIDE Ę E, 5百里自 UINYL ACETATE SE24 BPOMODICHLOPOMETHANE Fr.6. - 13 1.2-D10H0BBBBBBBBBBB შირ86 TP!CHLOPOETHENE Sec. - 6 ES BROMBEHL GROMET HAME Ę. 5-684 1.1.2-TRICHLORDETHANE FeeD2 trans-1,3-DICHLOROPROPENE E E E E A cis-1.3-D)CHLOPOFFORENE Ę, 56640 2-CHLOPOETHYLVINYL ETHER గ్రీగ**్ర** BROMUFORM. 36670 4-METHYL-2-PENTANONE ت مرم ک 2-HEYAN( NE 5-578 TETRACHLOPOETHENE 医安布尼德 1.1.0.2-TETRACHLDROCTH-WE  $\mathbb{S}_{0} \wedge \mathcal{E}_{0}$ TOLUENE ے جہتے کے CHU OROBEMZE 45 50666 ETHYLBENZENE 56674 STYRENE 56694 m-XYLENE 36696 S-MYLENE 5 ₹66**9**7 p-XYLENE 5 TOTAL XYLENGS 5 56648 1,2-DICHLOROBENZENE 5 医拟氯甲酚 1.3-DICHURPOSENZENE 1,4-DICHLOPOBENZENE MRGGATE COMPOUND RECOVERIES SOIL LINITS AQUEOUS L :FB1 DWWBIICHLORDETHAME 20-12:% 76-11-% . 97 SEA DE-TOLUENE 84-138% 88-110% RE PROMOTE HORRESENCE 59-117%

86-138%

### NET ATLANTIC, INC. CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME: 920930 13:35 ANALYST: MARK INSTRUMENT: HP59 70 BLANK FILE: >G8042 MATRIX: SDIL AQUEOUS MEDIUM LEVEL REPORTING LIMIT RESULT **TEST** COMPOUND NAME UG/KG UG/L UG/L UGZKG 56644 CHLOROMETHANE 5 ND 5 BROMOMETHANE 56628 5 56692 UINYL CHLORIDE 5 56638 CHLORDETHANE 5 5668B TRICHLOROFLUOROMETHANE 5 56672 METHYLENE CHLORIDE 5 56620 ACETONE 5 CARBON DISULFIDE 56632 56652 1.1-DICHLORÚETHANE 1,1-DICHLORDETHENE 5 56656 5 **76658** trans-1,2-DICHLOROETHENE 5 cis-1,2-DICHLORDETHENE 56642 5 CHLOROFORM 5 56654 1.2-DICHLORGETHAME 5 2-BUTANONE (MEK) 56630 5 56682 1,1,1-TRICHLORDETHANE 5 56634 CARBON TETRACHLORIDE 4690 UINYL ACETATE 5 5 BROMODICHLOROMETHANE 5624 Ε, 5666B 1.2-DICHLOROPROPANE Ę, 56686 TRICHLORDETHENE 5 56646 DIBROMOCHLOROMETHANE 5 1.1.2-TRICHLOROETHANE 56684 5 56622 BENZEHE trans-1,3-DICHLOROPROPENE 5 56664 cis-1,3-DICHLOROPROPENE 5 56640 5 2-CHLORGETHYLUINYL ETHER 5 56626 BROMOFORM 5667Ü 4-METHYL-2-PENTANONE 5 5 56658 2-HEYANDRIE 5 56578 TETRACHLORDETHENE 5 56676 1.1.2,2-TETRACHLOPDETHANE 5 5668Û TOLUENE 56536 CHLOROBENZENE 5 5 56666 ETHYLBENZENE 56674 STYRENE 5 56694 m-XYLENE È 56696 P-XXFEHE 56697 D-XYLENE 5 TOTAL XYLENES 5 56648 1,2-DICHLOROBENZENE 56650 5 1.3-DICHLOROBENZENE 56651 LUPROGATE COMPOUND RECOVERIES SOIL LIMITS ADDEDUS L ..101 ... 551 D4-DICHLORDETHAKE 70-121% 76-114% SS? DE-TOLUENE 84-138% 88-110% 105 953 BROMOFLUORDBENZENE B6-115% 59-117%

### NET DAMBRIDGE

### SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

JOB NO. 92.34//2 SAMPLE NO. 67139

- FILE .			KAISER					
COMPOUNDS		100		1	MS CONCENTRATION (UG/Kg)			LIMIT
,1-DICHLOROETHENE TRICHLOROETHENE BENZENE TOLUENE CHLOROBENZENE	1 50 1 50 1 50		0.0	1 1	39.9 38.9 44.8 47.4 42.6	;	69.61 94.81	52-13 65-14 55-13
FILE								
COMPOUNDS .	: SPIKE : ADDED :(UG/Kg)	100	NCENTRATION	ì		*	00 L	*
I,1-DICHLORGETHENE TRICHLOROETHENE BENTENE TOLUENE CHLOROBENZENE	50 50 50	1	41.3 47.3 51.3	1	87.3   62.5   94.5   102.6   50.2	5 8	1 22 1 1 24 1 1 21 1 1 21 1	62-13 66-14 59-13
						1. %	FPD F∂R <= 251	
	VALUE	5 <u>0</u> U	751DE OF 00	į	_IMITS			
RPD:	<u>0</u> 0	ט דע	<u> </u>	į	OUTSIDE LIMIT	Ξ		
SPINE RECOVERY	:0		0:17	1 (	outside	ŌΈ	LIMITS	
COMMENTS:								

3/90



### CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS 4 Gateway Center Pittsburgh PA 15222
PHONE (412) 497-2385



Cambridge Division, 12 Oak Park, Bedford, MA 01730

PHONE 3.718.		<u> </u>					1							<b>(</b>	
SAMPLED BY	HARLE	S E HAEFAS J	VER CRI	ule E/	faef	h f					//		ANALY	SES	source de la cita
(Prin	Do Ugla	S WEEKS	o g · a io · c	•	w	wire	. <del>1</del> 72_				;//	[			
SAMPLE NO.	TIME;	SAMPLE LOCATI	ON !	E G/P GOMP	VO OF CONTAINEE	SAMPLE MATRIX	PRESERVATIVE	, Joseph			\$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			COMME	VT9
CV-72-346-W45/1/23	1398 WE	ST STERAGE	ND 40	$\frac{1}{2}G[X]$	/	SOIL	ICE	X				X		EPA 5W8	
	1340			X			ICE	X	Ç				X	Method &	3240
CV-92-342-W51	1050		- <u>i</u>	<u>                                      </u>	1		TIE	X				X		1	
	1050			ן און	1		ICE	X					X		
(V-92-344-WSG	1219		•	X	1		ICE.	ΧĮ.	. 1	<b>-</b>	~~~	X	-		
(V-92-545-WG)	1219				1		JCE.	ΧŢ		<u>  ·     </u>	<del></del>		X	·	
	1250					_ -	丁にも		18	ļl		X			·
	1310			1 1 3 1			ICE	X	_ .	1		X			
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	1310	i	\ <u></u>	<b> </b>	1	*****	ICE	;;	-	بابته		743	12		,
CV-92-357-FBW	1353	+1	**	X	2	MATER	ICE	X			<u>ٔ إزم</u>	10/		- <b>Y</b>	
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Relinguished by	Date /	Time Rec	eived by , \	1911		Relinquis	hed by			to / Tim			Redgived t	<u></u>	<u>**</u>
Clark & Harly	1/23	11725	£		<u>ب</u>	الأبهع			19	19 / Tim 124 <sub>1</sub>	:	00	Mu	world	lar
Relinquished by	Date /		eived by			Relinquis	hed by:		Da	ite / Tim	ie	<b>\</b>	Received f	or Laboratory by	•
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	<del>- , </del>	þ.	1 — ORIGINAL	PT 2 NET Proje	eci Man	ager—Yell	ow PT 3—Cu	slomer	Сору—	Pink	10	Chi	CR / I	4C17VX 91	27/91-8

ENVIRONMENTAL 92. 34098
TESTING, INC. 92. 34096
Pairk, Bedford, MA 01730 CHAIN OF CUSTODY RECORD PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KNICER ENGINEERS
ADDRESS Y Gateway Conter Pittsburgh PA 15222
PHONE (412) 497-2385 Cambridge Division, 12 Oak Park, Bedford, MA 01730 SAMPLED BY ANALYSES CHARLES E. HABENER P'A' Nam DOVGLAS WEEKS IR SAMPLE SAMPLE PRESERVATIVE DATE TIME SAMPLE LOCATION COMMENTS CV-92-350-5799/23/645 CV. TH SIMAGE IAD 408 EPA SW846 CV-92-351-ST9 Method 8240 SUIL TIE ICE CV-92-354 = 5192 SUIL CV-92-355-5152 4 1716 TCE SOIL CV-92-356-SIGOV 1729 TCE SCIL V. THEFAFR 165 1/201 6 6 Relinquished by Received by Relinquished by Date / Time Received by CHARLEGE HAETNER9/231 Relinquished by Received by PT 2 NET Project Manager—Yellow

CHAIN OF CUSTODY RECORD

NATIONAL ENVIRONMENTAL TESTING, INC.

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS FOUR GATEWAY CENTER PIHSburgh PA 15-222 Carribridge Division, 12 Oak Park, Bedford, MA 01730
PHONE (412) 497

SAMPLED BY	<del> </del>					<u> </u>				25 - 17	A					0.F.C	
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(Print Na	ime)	E. (11E)	Signatu			eage /	<i>y.</i>				(control	/ &	//	/ /s		XX	<b>A</b> HITT
SAMPLE DATE TI	ME	SAMPLE LOC	ATION	SIZE G	GRAB	COMP NO OF CONTAINER	SAMPLE MATRIX	PRESERVATIVE		Color				200		× 100	AMENTS
CV-92-330-I34 9/40	904 Inc/	erator	PAD	400	SX	1	Soil	ICE	X				X				5N846
(V-92-331-134 9/24 0		nerator	Pad.	1	1 1.	1			X						X	Metho	8240
CV-92-352-I36 9/24 00									X				X				
CV-92-333-136 7/2409			¥	-					X		_		1		XĻ		_ 3
~V-92-334- IS6 7/24 07			: !	<u> </u>	[_  <u> </u> _	_ _ _			X.	£	_		X			ļ	
CV-92-335-ISG 7/24 01		- A SAMP BOOK 1 -, ARTA			<b>!</b>	<b>  }</b> _	<b>I</b>		<b> X</b>					_	X		-
CV-92-326-I113 9/24/08			<u> </u>	_  <b>                                   </b>		_ <b> </b>	<del>                                     </del>		ΙΧ,				X			<b>-</b>	
CV-92-357- III3 9/24 0		1:4	i e a production de la constantion de la constan	╼┼╏╁╌			<u> </u>		X				-		X	_	116 177
1V-92-338- 124 9/240			<u> </u>				<b>  </b>		X				-		X		
CV-92-339- I45 9/24 01					· 🗸	<b>V</b>	₩	Ψ	<b>(</b> )		$\bot$		-	<b>-</b> ,-	X		_
N-92-358-FBI 9124 10		<u> </u>		40m (	1 /	2	Water	ICE	X				X		<u>.   -</u>		
10-92-353-3146 9/24 11	15 SAJ #	5to 100	e PAD	402 6	3 X	1	Soil	ICE	X			3			X	_	<u> </u>
·V-92-360-51469/24 11	30 SOUTA	Tto Cask	PAV		X		5011	Ice		<del>                                     </del>			<b>X</b>	$\vdash$			<b>V</b>
				_     -			ļ				-						
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CHARLES E HAEFNE	29/24/82	1230	•						`.	. 19	7/251	113	OO		Ma	wood	Moon
Relinquished by	Date / Time		Received by		· · · · · · · · · · · · · · · · · · ·		Refinquis	ned by:			ate / Ti			Hec	eived to	or Laboratory	by.
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Method of NET 7	98251				क्षेत्र सम्बद्धाः वर्षे	開門會							Hale.				in a since
FERA	,		Î	- 12' -						N. T.							



### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Project: PPG Soil VOAs-Now RUN

10/19/1992

NET Job Number: 92.34098

National Environmental Testing

NET Atlantic, Inc. Cambridge Division 12 Oak Park Bedford, MA 01730

### **NET Cambridge Division**

### ANALYTICAL REPORT

Report To:

Reported By:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222

National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 10/19/1992

Collected By: ICF

NET Job Number: 92.34098

Project: PPG Soil VOAs-Now RUN

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG Soil VOAs-NOW RUN

Airbill No: 4450798273

NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler

NET Project Manager

Michael F. Detaney, Ph.D. Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX	
CV-92-351-S79 CV-92-359-W60A	67060 67068	09/23/1992 09/23/1992	16:45 13:10	09/24/1992 09/24/1992	SOIL	

ort Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-879

Parameter				Analysis	
Acetone	Parameter	Result	Units	Date	Analyst
Acetone					
Benzene         <6.0	TCL Volatiles by GC/MS 8240 S				
8romodichloromethane         <6.0	Acetone		ug/Kg	10/06/1992	dry
Bromomethene         <6.0			ug/Kg		
Bromomethane			ug/Kg		
2-Butanone (MEK)         46.0         ug/kg           Carbon Disulfide         46.0         ug/kg           Carbon Tetrachloride         46.0         ug/kg           Chloroethane         46.0         ug/kg           2-Chloroethylvinyl ether         46.0         ug/kg           Chloroform         46.0         ug/kg           Chloromethane         46.0         ug/kg           Chloromethane         46.0         ug/kg           1,2-Dichloromethane         46.0         ug/kg           1,2-Dichlorobenzene         46.0         ug/kg           1,4-Dichlorobenzene         46.0         ug/kg           1,4-Dichlorobenzene         46.0         ug/kg           1,1-Dichloroethane         46.0         ug/kg           1,2-Dichloroethane         46.0         ug/kg           1,2-Dichloroethane         46.0         ug/kg           1,2-Dichloropropane         46.0         ug/kg           cis-1,3-Dichloropropane         46.0         ug/kg           cis-1,3-Dichloropropane         46.0         ug/kg           cis-1,3-Dichloropropane         46.0         ug/kg           cis-1,3-Dichloropropane         46.0         ug/kg           thylbenzene			ug/Kg		
Carbon Disulfide         <6.0	Bromomethane		ug/Kg		
Carbon Tetrachloride         <6.0			ug/Kg		
Chloroethane         <6.0	Carbon Disulfide	<6.0	ug/Kg		
Chloroethane         46.0         ug/kg           2-Chloroethylvinyl ether         46.0         ug/kg           Chloroform         46.0         ug/kg           Chloromethane         46.0         ug/kg           Dibromochloromethane         46.0         ug/kg           1,2-Dichlorobenzene         46.0         ug/kg           1,3-Dichlorobenzene         46.0         ug/kg           1,4-Dichloroethane         46.0         ug/kg           1,1-Dichloroethane         46.0         ug/kg           1,2-Dichloroethane         46.0         ug/kg           1,2-Dichloropropane         46.0         ug/kg           1,2-Dichloropropane         46.0         ug/kg           cis-1,3-Dichloropropene         46.0         ug/kg           trans-1,3-Dichloropropene         46.0         ug/kg           Ethylbenzene         46.0         ug/kg           2-Hexanone         46.0         ug/kg           4-Methyl-2-pentanone (MIBK         46.0         ug/kg           4-Methylene Chloride         46.0         ug/kg           Styrene         46.0         ug/kg           1,1,2,2-Tetrachioroethane         46.0         ug/kg           1,1-Trichloroethane	Carbon Tetrachloride	<6.0	ug/Kg		
2-Chloroethylvinyl ether       <6.0			ug/Kg		
Chloroform         <6.0	Chloroethane	<6.0	ug/Kg		
Chloromethane         46.0         ug/kg           Dibromochloromethane         46.0         ug/kg           1,2-Dichlorobenzene         46.0         ug/kg           1,3-Dichlorobenzene         46.0         ug/kg           1,4-Dichlorobenzene         46.0         ug/kg           1,1-Dichloroethane         46.0         ug/kg           1,2-Dichloroethane         46.0         ug/kg           1,2-Dichloropthane         46.0         ug/kg           trans-1,2-Dichloropropene         46.0         ug/kg           cis-1,3-Dichloropropene         46.0         ug/kg           trans-1,3-Dichloropropene         46.0         ug/kg           Ethylbenzene         46.0         ug/kg           2-Hexanone         46.0         ug/kg           4-Methyl-2-pentanone (MIBK         46.0         ug/kg           Ketyrene         46.0         ug/kg           Styrene         46.0         ug/kg           1,1,2,2-Tetrachloroethane         46.0         ug/kg           10uene         46.0         ug/kg           1,1,1-Trichloroethane         46.0         ug/kg           1,1,1-Trichloroethane         46.0         ug/kg           1,1,1-Trichloroethane	2-Chloroethylvinyl ether	<6.0	ug/Kg		
Dibromoch loromethane         <6.0	Chloroform	<6.0	ug/Kg		
1,2-Dichlorobenzene       <6.0	Chloromethane	<6.0	ug/Kg		
1,3-Dichlorobenzene       <6.0	Dibromochloromethane	<6.0	ug/Kg		
1,4-Dichlorobenzene       <6.0	•	<6.0	ug/Kg		
1,1-Dichloroethane       <6.0	1,3-Dichlorobenzene	<6.0	ug/Kg		
1,2-Dichloroethane       <6.0	1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethene       <6.0	1,1-Dichloroethane	<6.0	ug/Kg		
trans-1,2-Dichloroethene       <6.0	1,2-Dichloroethane	<6.0	ug/Kg		•
1,2-Dichloropropane       <6.0	1,1-Dichloroethene	<6.0	ug/Kg		
cis-1,3-Dichloropropene       <6.0	trans-1,2-Dichloroethene	<6.0	ug/Kg		
trans-1,3-Dichloropropene       <6.0	1,2-Dichloropropane	<6.0	ug/Kg		
Ethylbenzene       <6.0	cis-1,3-Dichloropropene	<6.0	ug/Kg		
2-Hexanone       <6.0	trans-1,3-Dichloropropene	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	Ethylbenzene	<6.0	ug/Kg		
Methylene Chloride         <6.0	2-Hexanone	<b>&lt;6.0</b>	ug/Kg		
Styrene       <6.0	4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane       <6.0	Methylene Chloride	<6.0	ug/Kg		
Tetrachloroethene       <6.0	Styrene	<6.0	∪g/Kg		
Toluene       <6.0	1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
1,1,1-Trichloroethane       <6.0	Tetrachloroethene	<6.0	ug/Kg		
1,1,2-Trichloroethane       <6.0	Toluene	<6.0	ug/Kg		
Trichloroethene         <6.0	1,1,1-Trichloroethane	<6.0	ug/Kg		
Trichlorofluoromethane         <6.0	1,1,2-Trichloroethane	<6.0	ug/Kg		
Vinyl Acetate         <6.0	Trichloroethene	<6.0	ug/Kg		
Vinyl Chloride         <6.0	Trichlorofluoromethane	<6.0	ug/Kg		
m-Xylene <6.0 ug/Kg o-Xylene <6.0 ug/Kg	Vinyl Acetate	⋖6.0	ug/Kg		
o-Xylene <6.0 ug/Kg	Vinyl Chloride	<6.0	ug/Kg		
	m-Xylene	<6.0	ug/Kg		
p-Xylene <6.0 ug/Kg	o-Xylene	<6.0	ug/Kg		
	p-Xylene	<6.0	ug/Kg		

ort Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-359-W60A

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				******
Acetone	<5.0	ug/Kg	10/06/1992	dhg
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichioroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	∪g/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachioroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyt Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

### INATIONAL 92, 34096 ENVIRONMENTAL 92, 34096 F CUSTODY RECORD CHAIN PROJECT NAME PPG CIRCLEVILLE COMPANY ICF KAISER ENGINEERS ADDRESS 4 Gateway Center Pittsburgh PA 15222 PHONE (412) 4971-2385 Cambridge Division, 12 Oak Park, Bedford, MA 01730 SAMPLED BY **ANALYSES** CHARLES E. MAEFNER P'A' NOT DOUGLAS WEEKS IR SAMPLE PHESERVATIVE SAMPLE DATE TIME SAMPLE LOCATION COMMENTS 4-72-30 57971231648 CO. TH SIRRAGE 1412 402 G TON SUPPLY 5016 Method 8240 V-77.8-1-577 401.d 706 73/39/5146 TCE V-92-354-515次 SOZU V-92-355-5192 1710 SOIL ICE G V-92-356-SIDOV 1725 G SUEL TCE Relinquished by Received by: Relinquished by Date / Time Received by: HARLEGE HAEFNERA /23 Relinquished by: Received by Method of Shipment FETTERAL Express PT 1 -- ORIGINAL PT 2 NET Project Manager-Yellow PT 3-Customer Copy-Pink

**MPS** 

19257268404

CHAIN ICUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE COMPANY ICH KRISER ENGINEERS

ADDRESS 4 GILLERY Center Pittsburgh PA 15,202 PHONE 1412 ) 497-2385



INATICINAL ENVIRONMENTAL TESTING, INC.

Cambridge Division, 12 Oak Park, Bedford, MA 01730

CHARLES E. HAEFIER Charle & Langle

IPH Namon Douglas WEFIES JR Signature Dingles We

(Print Name) SAMPLED BY ANALYSES SAMPLE SAMPLE PRESERVATIVE DATE TIME! SAMPLE LOCATION NO. COMMENTS ; 宋 郑 即到到80004 NES; 50 600 1 Nis 400 G X TEP SEPTIFE 7 ( ). Methed 5240 ひひつり ロールザ 134 101 V-92-342-W51 工(仨 1050 [V-92-543-USI TUE 1050 ICE (V-92-344-WSE , 1219 W-92-345-WSA ナイミ 1219 TCE 1250 V-92-346-W60 1310 1-92-347-WEOA TCE 1-92-348-W6 1120 ICE V-92-349-W44 135 TCE 1-92-359-WEGAV TC区 1310 J-92-357.FBW ŧ١ WATER ICE 1553 Date / Time Received by Received by Relinquished by Date / Time 1/23/1725 Received by Relinquished by: Rendered results of 5 day TA Sample And Method of Shipment Fed-X-press PT 2 NET Project Manager—Yellow 4450798273

### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear

ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Project: PPG RUSH SOIL VOAs

11/10/1992

NET Job Number: 92.34511

National Environmental Testing

NET Atlantic, Inc. Cambridge Division 12 Oak Park Bedford, MA 01730

### **NET Cambridge Division**

### ANALYTICAL REPORT

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Reported By:

National Environmental Testing NET Atlantic, Incorporated Cambridge Division

12 Oak Park

Bedford, MA 01730

Report Date: 11/10/1992

Collected By: ICF

NET Job Number: 92.34511

Project: PPG RUSH SOIL VOAs

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs

Airbill No: 3977256920

NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler NET Project Manager

Michael F. Delaney, Ph.D. Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE Rec'd	MATRIX
10		IANER	AREN	REC'D	MAINIA
CV-92-0524-124	68790	10/31/1992	10:25	11/02/1992	SOIL
CV-92-0525-145	68791	10/31/1992	10:40	11/02/1992	SOIL
CV-92-0526-S100	68792	10/31/1992	11:08	11/02/1992	SOIL
CV-92-0527-W6	68793	10/31/1992	11:45	11/02/1992	SOIL
cv-92-0528- <del>u</del> 44	68794	10/31/1992	11:30	11/02/1992	SOIL
CV-92-0529-FBW	68795	10/31/1992	11:55	11/02/1992	BLANK

port Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0524-I24

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S		*******		
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg	, 02, , 2	,
Bromodichioromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichtorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	∪g/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichtoropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	≪6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	21	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	⊔g/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	∪g/Kg		
Trichloroethene	<6.0	∪g/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

nort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0525-145

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S	.E O		44.05.4000	
Acetone	<5.0	ug/Kg	11/05/1992	dhg
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0 <5.0	ug/Kg		
2-Butanone (MEK)	<5.0 <5.0	ug/Kg		
Carbon Disulfide		ug/Kg		
Carbon Tetrachloride	<5.0 <5.0	ug/Kg		
Chiorobenzene		ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichtorobenzene	<5.0	ug/Kg		
1,3-Dichtorobenzene	<5.0	ug/Kg		
1,4-Dichtorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0 .*.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	13	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	⊔g/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

ort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0526-\$100

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chioromethane	⋖6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichioropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	31	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

Poort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0527-W6

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/08/1992	dhg
Benzene	<b>&lt;6.</b> 0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<b>&lt;6.0</b>	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chioroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	∪g/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chioride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachioroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl-Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
p-Xylene	<b>&lt;6.</b> 0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

port Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0528-W44

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	ďng
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachtoride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<b>&lt;6.0</b>	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Yetrachioroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyt Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xyl ene	<6.0	ug/Kg		
p-Xyl ene	<6.0	ug/Kg		

mort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0529-FBW

			Analysis			
Parameter	Result	Units	Date	Analyst		
TCL Volatiles by GC/MS 624 AQ			44.07.44000			
Acetone	<5.0	ug/L	11/04/1992	cdl		
Benzene	<5.0	ug/L				
Bromodichloromethane	<5.0	ug/L				
Bromoform	<5.0	ug/L				
Bromomethane	<5.0	ug/L				
2-Butanone (MEK)	<5.0	ug/L				
Carbon Disulfide	<5.0	ug/L				
Carbon Tetrachloride	<5.0	ug/L				
Chlorobenzene	<5.0	ug/L				
Chloroethane	<5.0	ug/L				
2-Chioroethylvinyl ether	<5.0	ug/L				
Chleroform	<5.0	ug/L				
Chloromethane	<5.0	ug/L				
Dibromochloromethane	<5.0	ug/L				
1,2-Dichlorobenzene	<5.0	ug/L				
1,3-Dichlorobenzene	<5.0	ug/L				
1,4-Dichlorobenzene	<5.0	ug/L				
1,1-Dichloroethane	<5.0	ug/L				
1,2-Dichloroethane	<5.0	ug/L				
1,1-Dichloroethene	<5.0	ug/L				
trans-1,2-Dichloroethene	<5.0	ug/L				
1,2-Dichloropropane	<5.0	ug/L				
cis-1,3-Dichloropropene	<5.0	ug/L				
trans-1,3-Dichloropropene	<5.0	ug/L				
Ethylbenzene	<5.0	ug/L				
2-Hexanone	<5.0	ug/L				
4-Methyl-2-pentanone (MIBK	<5.0	ug/L				
Methylene Chloride	<5.0	ug/L				
Styrene	<5.0	ug/L				
1,1,2,2-Tetrachloroethane	<5.0	ug/L				
Tetrachloroethene	<5.0	ug/L				
Toluene	<5.0	ug/L				
1,1,1-Trichloroethane	<5.0	ug/L				
1,1,2-Trichloroethane	<5.0	ug/L				
Trichloroethene	<5.0	ug/L				
Trichlorofluoromethane	<5.0	ug/L				
Vinyl Acetate	<5.0	ug/L				
Vinyl Chloride	<5.0	ug/L				
m-Xylene	<5.0	ug/L				
o-Xylene	<5.0	ug/L				
p-Xylene	<5.0	ug/L				

### **NET Cambridge Division**

### **QUALITY CONTROL DATA**

cient: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date: 11/10/1992

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	<b>SS9</b>	SS10	SS11	SS12
Danmadi	1.5.6:-	* a   a a a	Dagasi	1 2-Dia	Taluese						

Bromofi 1,2-Dic Toluene Bromofi 1,2-Dic Toluene

						Perce	ent Reco	very						
Sample ID	NET ID	) Matrix	SS1	SS2	\$\$3	\$\$4	<b>SS</b> 5	SS6	SS7	SS8	559	\$\$10	SS11	\$\$12
CV-92-0524-124	68790	SOIL				76	81	95				******		
CV-92-0525-145	68791	SOIL				85	88	119						
CV-92-0526-\$100	68792	SOIL				86	98	111						
CV-92-0527-W6	68793	SOIL				88	78	93						
CV-92-0528-W44	68794	SOIL				82	96	115						
CV-92-0529-FBW	68795	BLANK	107	100	95									

.....

Notes

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard. Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:

Decacht = Decachtorobiphenyt Dibutyl = Dibutylchtorendate

Tetrach = Tetrachloro-m-xylene

Volatile Surrogate Standards:

Bromofl = Bromofluorobenzene

1,2-Dichl = 1,2-Dichloroethane-d4

Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

Semivolatlile Surrogate Standards:

2-Fluor (1st) = 2-Fluorobiphenyl

Phenoi- = Phenoi-dó

2,4,6-T = 2,4,6-Tribromophenol

2-Fluor (2nd) = 2-Fluorophenol Nitrobe = Nitrobenzene-d5

p-Terph = p-Terphenyl

• • •

<u>Herbicides Surrogate Standard</u>:

2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:

2-Fluor = 2-Fluorobiphenyl

para-Te = para-Terphynyl

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

### Method Blank Analysis Data

			Run	Rum	Analyst	
Test Name	Result	Units	Batch	Date	Initials	- · · · · · · · · · · · · · · · · · · ·
TO Walnailas by CC/MC 92/0 C						********
TCL Volatiles by GC/MS 8240 S	108	% recov.	281	11/05/1992	dhg	
Bromofluorobenzene 1.2-Dichloroethane-d4	102	% recov.	281	11/05/1992	dhg	
•	107	% recov.	281	11/05/1992	dhg	
Toluene-d8	<5.0		281		dhg	
Acetone	<5.0	ug/Kg	281	11/05/1992	dhg	
Benzene	<5.0	ug/Kg	281	11/05/1992	dhg	
Bromodichloromethane		ug/Kg		11/05/1992	<del>-</del>	
Bromoform	<5.0	ug/Kg	281	11/05/1992	dhg	
Bromomethane	<5.0	ug/Kg	281	11/05/1992	dhg	
2-Butanone (MEK)	<5.0	ug/Kg	281	11/05/1992	chg	
Carbon Disulfide	<5.0	ug/Kg	281	11/05/1992	dhg	
Carbon Tetrachloride	<5.0	ug/Kg	281	11/05/1992	dhg	
Chlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg	
Chloroethane	<5.0	ug/Kg	281	11/05/1992	dhg	
2-Chloroethylvinyl ether	<5.0	ug/Kg	281	11/05/1992	qpa	
Chloroform	<5.0	ug/Kg	281	11/05/1992	dhg	
Chloromethane	<5.0	ug/Kg	281	11/05/1992	dhg	
Dibromochloromethane	<5.0	ug/Kg	281	11/05/1992	dhg	
1,2-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg	
1,3-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg	*
1,4-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg	
1,1-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg	
1,2-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg	
1,1-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg	
trans-1,2-Dichloroethene	<5.0	ug/Kg	281	11/05/1 <del>99</del> 2	dhg	
1,2-Dichloropropane	<5.0	ug/Kg	281	11/05/1992	dhg	
cis-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg	
trans-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg	
Ethylbenzene	<5.0	ug/Kg	281	11/05/1992	ding	
2-Hexanone	<5.0	∪g/Kg	281	11/05/1992	dhg	
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	281	11/05/1992	ding	
Methylene Chloride	<5.0	ug/Kg	281	11/05/1992	dhg	•
Styrene	<5.0	ug/Kg	281	11/05/1992	dhg	
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	281	11/05/1992	cing	
Tetrachloroethene	<5.0	ug/Kg	281	11/05/1992	dhg	
Toluene	<5.0	ug/Kg	281	11/05/1992	dhg	
1,1,1-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	ding	
1,1,2-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg	-
Trichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg	
Trichlorofluoromethane	<5.0	ug/Kg	281	11/05/1992	dhg	
Vinyl Acetate	<5.0	ug/Kg	281	11/05/1992	dhg	
Vinyl Chloride	<5.0	ug/Kg	281	11/05/1992	dhg	
m-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg	
o-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg	
p-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg	

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

### Method Blank Analysis Data

		IK AIRCYSTS DO			
			Rum	Run	Analyst
Test Name	Result	Units	Batch	Date	Initials
TCL Volatiles by GC/MS 8240 S					
Bromofiuorobenzene	107	% recov.	283	11/08/1992	ding
1,2-Dichloroethane-d4	91	% recov.	283	11/08/1992	dhg
Toluene-d8	110	% recov.	283	11/08/1992	dhg
Acetone	<5.0	ug/Kg	283	11/08/1992	dhg
Benzene	<5.0	ug/Kg	283	11/08/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Bromoform	<5.0	ug/Kg	283	11/08/1992	dīng
Bromomethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Disulfide	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	283	11/08/1992	dhg
Chlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroform	<5.0	ug/Kg	283	11/08/1992	dhg
Chioromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	ding
1,3-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,4-Dichtorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	ding
1,2-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	ding
1,1-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	283	11/08/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
Ethylbenzene	<5.0	ug/Kg	283	11/08/1992	dhg
2-Hexanone	<5.0	ug/Kg	283	11/08/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	283	11/08/1992	dhg
Methylene Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
Styrene	<5.0	ug/Kg	283	11/08/1992	ding
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Tetrachioroethene	<5.0	ug/Kg	283	11/08/1992	ding
Toluene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dîng
1,1,2-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	ding "
Trichloroethene	<5.0	ug/Kg	283	11/08/1992	ding
Trichlorofluoromethane	<5.0	ug/Kg	283	11/08/1992	ding
Vinyl Acetate	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
m-Xylene	<5.0	ug/Kg	283	11/08/1992	ding
o-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
p-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

### Method Blank Analysis Data

		MCCHOC DIO	in nimityara Di	970			
				Run	Run	Analyst	
	Test Name	Result	Units	Batch	Date	Initials	
••	TCL Volatiles by GC/MS 624 AQ		*				
	Bromofluorobenzene	111	% recov.	846	11/04/1992	cdl	
	1,2-Dichloroethane-d4	99	% recov.	846	11/04/1992	cdl	
	Toluene-d8	108	% recov.	846	11/04/1992	cdt	
	Acetone	<5.0	ug/L	846	11/04/1992	cdl	
	Benzene	<5.0	ug/L	846	11/04/1992	cdl	
	Bromodichloromethane	<5.0	ug/L	846	11/04/1992	cdl	
	Bromoform	<5.0	Ug/L	846	11/04/1992	cdl	
	Bromomethane	<5.0	ug/L	846	11/04/1992	cdl	
	2-Butanone (MEK)	<5.0	ug/L	846	11/04/1992	cdl	
	Carbon Disulfide	<5.0	ug/L	846	11/04/1992	cdl	
	Carbon Tetrachionide	<5.0	ug/L	846	11/04/1992	cdl	
	Chlorobenzene	<5.0	ug/L	846	11/04/1992	cdl	
	Chloroethane	<5.0	ug/L	846	11/04/1992	cdl	
	2-Chloroethylvinyl ether	<5.0	ug/L	846	11/04/1992	cdl	
	Chloroform	<5.0	ug/L	846	11/04/1992	cdl	
	Chloromethane	<5.0	ug/L	846	11/04/1992	cál	
	Dibromochloromethane	<5.0	ug/L	846	11/04/1992	cdl	
	1,2-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl	
	1,3-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl	
	1,4-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdi	
	1,1-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl	
	1,2-Dichioroethane	<5.0	ug/L	846	11/04/1992	cdl	
	1,1-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl	
	trans-1,2-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl	
	1,2-Dichloropropane	<5.0	ug/L	846	11/04/1992	cdl	
	cis-1,3-Dichtoropropene	<5.0	ug/L	846	11/04/1992	cdl	
	trans-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl	
	Ethylbenzene	<5.0	ug/L	846	11/04/1992	cdl	
	2-Hexanone	<5.0	ug/L	846	11/04/1992	cdl	
	4-Methyl-2-pentanone (MIBK	<5.0	ug/L	846	11/04/1992	cdl	
	Methylene Chloride	<5.0	ug/L	846	11/04/1992	cdl	
	Styrene	<5.0	ug/L	846	11/04/1992	cdl	
	1,1,2,2-Tetrachloroethane	<5.0	ug/L	846	11/04/1992	cdl	
	Tetrachloroethene	<5.0	ug/L	846	11/04/1992	cdl	
	Toluene	<5.0	ug/L	846	11/04/1992	cdl	
	1,1,1-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl	
	1,1,2-Trichtoroethane	<5.0	ug/L	846	11/04/1992	cdl	-
	Trichloroethene	<5.0	ug/L	846	11/04/1992	cdl	
	Trichlorofluoromethane	<5.0	ug/L	846	11/04/1992	cdl	
	Vinyl Acetate	<5.0	ug/L	846	11/04/1992	cdi	
	Vinyl Chioride	<5.0	ug/L	846	11/04/1992	cdl	
	m-Xylene	<5.0	ug/L	846	11/04/1992	cdl	
	o-Xylene	<5.0	ug/L	846	11/04/1992	cdl	
	p-Xylene	<5.0	ug/L	846	11/04/1992	cdl	

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date: 11/10/1992

### Matrix Spike/Matrix Spike Duplicate Results

	Spike	Sample		MS	MS %	MSD	HSD %	
Compound	Amount	Result	Units	Result	Recovery	Result	Recovery	RPD
TCL Volatiles by GC/MS 8240	S	*******						
Acetone	0.0	<5.0	ug/Kg	•				
Benzene	50.0	<5.0	ug/Kg	54.1	108.20	45.2	90.40	17.80
Bromodichloromethane	0.0	<5.0	ug/Kg					
Bromoform	0.0	<5.0	ug/Kg					
Bromomethane	0.0	<5.0	ug/Kg					
2-Butanone (MEK)	0.0	<5.0	ug/Kg					
Carbon Disulfide	0.0	<5.0	ug/Kg					
Carbon Tetrachtoride	0.0	<5.0	ug/Kg					
Chlorobenzene	50.0	<5.0	ug/Kg	47.4	94.80	38.8	77.60	20.00
Chloroethane	0.0	<5.0	ug/Kg					
2-Chloroethylvinyl ether	0.0	<5.0	ug/Kg					
Chioroform	0.0	<5.0	ug/Kg					
Chloromethane	0.0	<5.0	ug/Kg					
Dibromochloromethane	0.0	<5.0	ug/Kg					
1,2-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,3-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,4-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,1-Dichloroethane	0.0	<5.0	ug/Kg					
1,2-Dichloroethane	0.0	<5.0	ug/Kg					
1,1-Dichloroethene	54.3	12	ug/Kg	66	99.40	43.8	58.60	51.60
trans-1,2-Dichloroethene	0.0	<5.0	ug/Kg					
1,2-Dichloropropane	0.0	<5.0	ug/Kg					
cis-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
trans-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
Ethylbenzene	0.0	<5.0	ug/Kg					
2-Hexanone	0.0	<5.0	ug/Kg					•
4-Methyl-2-pentanone (MIBK	0.0	<5.0	ug/Kg					
Methylene Chloride	0.0	<5.0	ug/Kg					
Styrene	0.0	<5.0	ug/Kg					
1,1,2,2-Tetrachloroethane	0.0	<5.0	ug/Kg					
Tetrachioroethene	0.0	<5.0	ug/Kg					
Toluene	50.0	<5.0	ug/Kg	61.0	122.00	45.6	91.20	28.80
1,1,1-Trichloroethane	0.0	<5.0	ug/Kg					
1,1,2-Trichloroethane	0.0	<5.0	ug/Kg					
Trichloroethene	50.0	<5.0	ug/Kg	36.7	73.40	31.0	62.00	16.80
Trichlorofluoromethane	0.0	<5.0	ug/Kg					
Vinyl Acetate	0.0	<5.0	ug/Kg					
Vinyl Chloride	0.0	<5.0	ug/Kg					
m-Xylene	0.0	<5.0	ug/Kg					
o-Xylene	0.0	<5.0	ug/Kg					
p-Xylene	0.0	<5.0	ug/Kg					

NOTE: Data reported for spiked samples were analyzed in the same batch, but may not necessarily be that of your sample.

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	SAMPLEF	15: (Signi	ature)		ME cle	v.lle F	CRF	1 Clusure	NO.			//	<b>(N)</b>				7	
	Id. Da	glas (	Nech.	H.					CON-		/							REMARKS
	STA. NO.	DATE	TIME	COMP	GRAB	ST	ATION	LOCATION	TAINERS	1		//						11211111111
CV-94	.0524-124	10/31/	2 1025		X	Incinera	tor	PAD	1	X						Analyze	For V	OCS US.19
CV-94	0525-145	10/31	1040		X	Incinera	to	PMD	1	X						EPA-SW	-846	Method 8240
V 42.	1526-5100	10/31	1108		X	SOUTH /	AD		1	X								
(V-9)	2521·WU	10/31	1145			WEST PI			1	X								
CV-92	0558-1744	10/31	1130			WEST P			1	X								•
:V-9Z	-USL9-FBN	10/31	1155		X	WEST	AD		Z	X								
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	Relinquishe Dong	ed by: (Sig Un L	gnature)	k	w	Date/Time  31/92   122	15	Received by: (Signature,	CLLKS.	Reli	nquish	ed by:	(Signa	ture)		Date:	Time	Received by: (Signature)  Received by: (Signature)
	Relinquishe	ed by: (Si	gnature)			Date/Time		Received by (Signature,			nquish	ed by:	(Signa	ture)		Date/	Time	Received by: (Signature)
	Relinquishe	ed by: (Sig	gnature)			Date/Time		Received for Laboratory (Signature)	by:		Dai	le Time	8	Re	emarks	5	<u>.                                    </u>	
ļ			Distrib	ulion:	Origina	al Accompanies Sh	pment	; Copy to Coordinator Field Fil	es	<u> </u>				_				

### ATTACHMENT D

PPG Circleville Plant Safety Rules and Instructions

Partial Closure Plan 04512-08-C Revision: 3 Date: June 24, 1993

# CIRCLEVILLE PLANT SAFETY RULES AND INSTRUCTIONS

- The PPG Plant in Circleville is a manufacturer of Plastics and Resins. As a result, the products which are most used in the plant are paint thinners and solvents which are highly flammable. The possible presence of solvent vapors must always be considered during all phases of construction. In view of these hazards, the following safety rules are established:
  - No smoking anywhere on the premises except those areas which are especially designated.
  - Strike Anywhere Matches (Kitchen Matches) are not allowed in the plant.
  - C. No open flames, electric welding, or soldering without permission of the plant Engineering Department. Permissions for an open flame is not permission to smoke. Do not carry flint strikers for gas torches into hazardous areas. Use spark proof tolls and explosion proof equipment where needed. Use safety flashlights only.
  - D. Before welding, drilling or use of non-explosive proof equipment, a permit must be secured from the Engineering Office and signed by the Safety Department and Area Supervisor before job can be started.
  - E. No use of spark-causing reciprocating equipment; e.g., chisels, saws, hammers, etc., without permission of the Plant Engineering Department.
  - F. All equipment must be in first class condition.
  - G. Post signs or rope areas off when working overhead.
  - H. When announced over P.A. system that additions are being made to the kettles, evacuate 2nd and 3rd floor MR & RD areas until all clear is announced.
  - Stay clear of areas marked "75-10 in use;" this is a cleaning compounds that makes floors slippery and can cause severe burns.
  - J. Ground cables for welding should be attached directly to work piece rather than using plant structure for ground.

- K. Violations of Safety Rules constitute breach of contract and is cause for removal of Contractor. Also constitutes immediate discharge of employee or employees guilty of safety violation.
- L. Do not wear metal soled or heeled shoes or shoes with a metal cap or plate attached.
- M. Do not horseplay.
- N. Do not block fire extinguishers, exists, or alarm boxes.
- Do not use packages or drums in place of ladders.
- P. Do not jump from docks, trucks or platforms.
- Q. Eat lunch in lunch area only. We suggest washing the hands before eating.
- R. Report any malfunction or potential safety hazards to your foreman or superintendent.
- S. Housekeeping is part of your job.
- 2. When cutting into a pipe line or vessel, always know the code number of material that the pipe line or vessel has been used for. If you should accidentally get splashed, remove saturated clothing and flush the affected area of body with water for ten (10) minutes. Do not put saturated clothes or shoes back on unless you are advised to do so. Report incident with code number to your immediate foreman or superintendent and ask him to contact someone from PPG and they will supply information for additional treatment if needed.
- The parking of contractor's cars or trucks within the plant will not be permitted without approval of the plant Engineering Department.
- Safety glasses and hard hats must be worn at all times within the fenced area, unless you are in the cafeteria of one of the designated break areas.
- 5. When a fire alarm sounds, leave work area and go to parking lot until all clear. If you see smoke or fire, turn in alarm and proceed to outside area. Our fire alarm is a horn blast for 10 seconds, followed by a voice annunciation over the public address system identifying the zone of origin. The "All Clear" will be announced orally over the same public address system.

## ATTACHMENT E

**Risk Assessment** 

## **RISK ASSESSMENT**

## **FOR**

## RCRA PARTIAL CLOSURE

## prepared for

# PPG INDUSTRIES, INC. COATINGS AND RESINS DIVISION Circleville, Ohio

prepared by

ICF KAISER ENGINEERS, INC. Four Gateway Center Pittsburgh, Pennsylvania 15222

June 1993

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#### 1.0 INTRODUCTION

This risk assessment was prepared by ICF Kaiser Engineers, Inc. (ICF KE) for PPG Industries, Inc., Coatings and Resins Division, Circleville, Ohio in support of the implementation of the Partial Closure Plan for three interim status hazardous waste management units. This report is prepared in compliance with Ohio EPA's (OEPA) Closure Plan Guidance Manual (1991) despite the fact that some of the required approaches are unachievable under actual conditions. Approaches recommended by the U.S. EPA (1989a; 1989b) are also incorporated. The document is designed to identify non-cancer hazards and theoretical excess lifetime cancer risks associated with current site conditions. As discussed with OEPA, groundwater exposure pathways are not addressed since TCLP results were negative. This document is intended to function as a companion document to the Partial Closure Plan by ICF KE, dated February, 1993. As such, the sampling and analytical data incorporated into this report are derived from that source.

#### 1.1 PURPOSE OF THE RISK ASSESSMENT

Risk assessment is defined as the scientific evaluation of human and environmental health impacts posed by a particular substance or mixture of substances. The purpose of this risk assessment is to provide a quantitative analysis, in a manner consistent with the required approaches of the OEPA, of the likelihood of adverse effects associated with potential residential exposures to chemicals in environmental media in the units.

Specific objectives of this risk assessment are:

- to provide an analysis of baseline risks according to OEPA requirements;
- to provide a basis for determining levels of chemicals that can remain onsite and still be adequately protective of public health; and
- to provide a consistent process of evaluating and documenting public health protective measures.

To achieve these goals, the scientific basis and validity of values incorporated into the assessment are considered and discussed in the context of primary research literature in order to provide a frame of reference for the conclusions.

#### 1.2 APPROACH

The organization of this risk assessment follows the guidelines originally prepared by the National Academy of Sciences (NAS, 1983), which suggest that risk assessments should contain some or all of the following four steps:

Hazard Identification (Identification of Chemicals of Concern). The focus of this step is to evaluate site investigation data, and identify chemicals of concern;

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- Dose-Response Assessment (Toxicity Assessment). This step involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern;
- **Exposure Assessment.** Identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and
- Risk Characterization. Description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action.

#### 1.3 REPORT ORGANIZATION

This report is organized in a manner consistent with the above mentioned sections of a risk assessment. The sections of the report are described below:

- Section 1 provides an introduction to the report.
- Section 2 describes the areas of concern at the site and the chemicals of concern in those areas.
- Section 3 describes the theoretical basis for derivation of health criteria for the chemicals of concern and presents the specific health criteria and their bases.
- Section 4 presents the likely human receptors of concern and utilizes defined exposure factors to estimate the magnitude of exposure of those receptors to the chemicals of concern.
- Section 5 presents the results of the analysis in which the risks associated with the defined exposures are quantified and summarized.
- Section 6 describes the uncertainties associated with the exposures and risks calculated.
- Section 7 presents the conclusions of the report.
- Section 8 presents the references used in the report.

#### 2.0 IDENTIFICATION OF CHEMICALS OF CONCERN

This section presents the basis for identification and selection of the chemicals of concern. In addition, the representative concentrations of each of the chemicals of concern and their distribution in each area of concern are also presented.

#### 2.1 SITE BACKGROUND

PPG owns and operates a resin manufacturing facility located on Pittsburgh Road approximately two miles south of Circleville, Pickaway County, Ohio. Resins produced at the facility are used in paints and industrial coatings serving a variety of commercial industries. The surrounding area is classified as industrial and agricultural. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat. The nearest residential development is approximately one-half mile from the plant boundary.

The facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The incinerator operated for approximately seventeen years (1971-1988) and drum storage pads were used for periods of five to twenty-four years. In 1987, a larger incinerator, the Energy Recovery Unit (ERU), began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants in North America and processes them for incineration.

Following the startup and operation of the ERU at the Circleville site, the drum storage pads (West and South pads) and Liquid Waste Incinerator were no longer used. The Liquid Waste Incinerator and the drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in the Partial Closure Plan. Closure of the three units included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

#### 2.2 DESCRIPTION OF AREAS OF CONCERN

The descriptions of the units are based in part on information contained in the RCRA Interim Status permit and are presented below. The former locations of the Liquid Waste Incinerator, West Pad and South Pad are indicated on Figure 1.

#### 2.2.1 Liquid Waste Incinerator

This unit consisted of a liquid waste incinerator with three lines (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. The incinerator area included a concrete containment area located southeast of the incinerator pad. Waste characterization for those materials treated in the incinerator included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

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D001: Aqueous Decanter Waste (aqueous phase byproduct from resin manufacturing process,

D002 containing VOCs and organic acids.

D035

F003: Still sludge including xylene, ethylbenzene and methylisobutyl ketone; and

F005: Still sludge including toluene and methyl ethyl ketone.

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

#### 2.2.2 Drum Storage Area; South Pad

This unit consisted of a flat, packed gravel area approximately 90 feet by 240 feet. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone).

#### 2.2.3 Drum Storage Area; West Pad

This unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10 feet by 100 feet. This unit was in use from 1975 to 1985. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

F002: Spent methylene chloride.

#### 2.2.4 Drum Storage Area; Still Pad

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East yard were removed and replaced.

#### 2.3 DATA COLLECTION

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Soil sampling results from 1989 and 1992 sampling events are included in Appendix A. The results of the sampling and analyses are presented as follows:

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#### 2.3.1 Incinerator Area

The soil around the incinerator was tested in 1989 for the constituents listed below. The representative sample points indicated on the sampling grids in this plan were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. A power auger was used to remove the top four to six inches of soil. The loose soil was removed and a grab sample was collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

#### 2.3.2 South Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in the previous section. Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080.

#### 2.3.3 West Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in Section 2.3.1. One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080.

#### 2.3.4 TCLP Data

As agreed with OEPA, four soil samples were collected and analyzed for TCLP on March 24, 1993. Constituents evaluated were ethylbenzene, methylisobutyl ketone, methylene chloride, toluene and xylenes. Each constituent was not detected in each of the samples (limit of detection of each was  $25 \mu g/l$ ). For this reason, groundwater exposure pathways are not considered further in the risk assessment.

#### 2.4 IDENTIFICATION OF CHEMICALS OF CONCERN

As required by OEPA, chemicals which were detected in each area during the sampling efforts described above were incorporated into this risk assessment. The chemicals of concern for each unit are presented in Table 2-1.

#### 2.5 REPRESENTATIVE CONCENTRATIONS OF CHEMICALS OF CONCERN

As required by OEPA, the representative chemical concentrations for the constituents of concern for use in this risk assessment were taken as the highest detected value in each unit. These values are presented in Table 2-2. As required, the maximum concentration detected at any one grid point was used to quantify the exposure from soil and air in each unit.

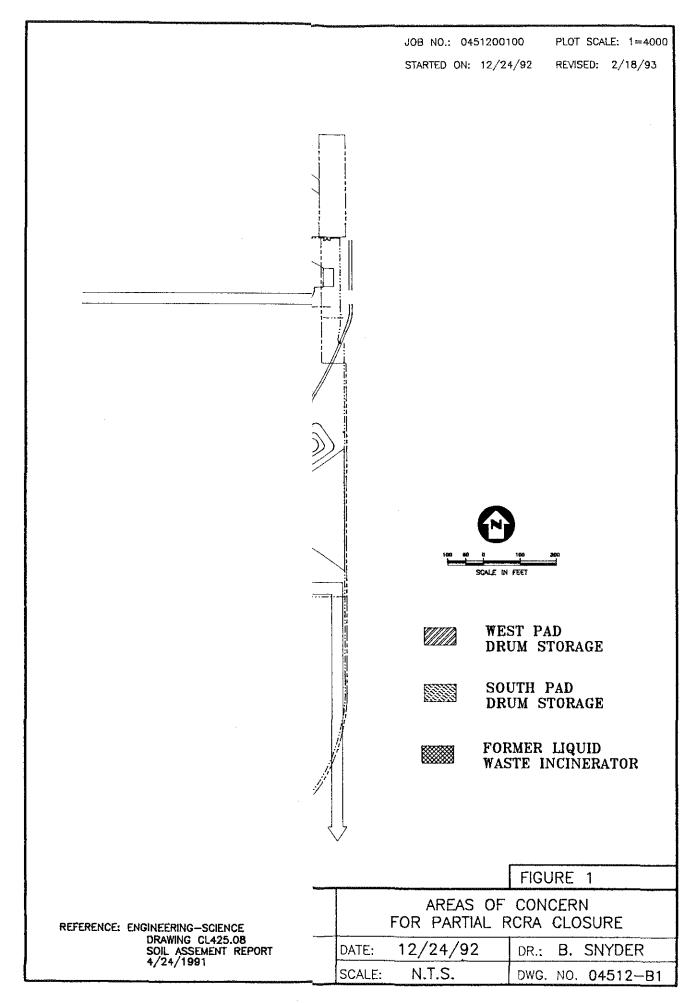


TABLE 2-1 SUMMARY OF CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	Xylene Ethylbenzene Methylene Chloride
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

See Figure 1 for the location of each area of concern.

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TABLE 2-2

MAXIMUM DETECTED CHEMICAL CONCENTRATIONS

CHEMICAL	AREA			
CHEMICAL	Incinerator Area	South Pad	West Pad	
Xylene	4.0	8.01	2.2	
Ethylbenzene	2.0	2.0	0.229	
MIBK	ND (<0.005)	0.006	ND <sup>2</sup> (<.005)	
Methanol	ND (<.968)	ND (<.968)	.0988	
Toluene	ND (<1.90)	21.0	1.34	
Methylene Chloride	4.0	3.0	ND (<.300)	

Values are in parts per million (ppm).

ND - Chemical was not detected in this area. Detection limits are listed for non-detects.

#### 3.0 DOSE-RESPONSE ASSESSMENT

Dose-response assessment is the process of characterizing the relationship between the dose of a chemical and the anticipated incidence of an adverse health effect (Preuss and Ehrlich, 1987). The majority of existing knowledge about the dose-response relationship is based on data collected from animal studies (usually rodents) or human occupational exposures, and the theory about what might occur in humans after exposure to environmental doses.

The U.S. EPA has developed dose-response assessment techniques to set "acceptable" levels of human exposure to chemicals in the environment. These U.S. EPA-derived risk criteria address both potential carcinogenic and chronic noncarcinogenic adverse health effects. The following section discusses the derivation of the acceptable dose levels, the manner in which these levels are used in this risk assessment, and the limitations of these values. The limitations are addressed in greater detail in the uncertainty section (Section 6.0).

#### 3.1 BACKGROUND ON NONCARCINOGENIC RESPONSE

It is widely accepted that non-cancer biological effects of chemical substances occur only after a threshold dose is achieved (Klaasen et. al., 1986). For the purposes of establishing non-cancer criteria, this threshold dose is usually estimated from the no observed adverse effect level (NOAEL) or the lowest observed adverse effect level (LOAEL) determined from chronic animal studies. The NOAEL is defined as the highest dose at which no adverse effects occur, while the LOAEL is defined as the lowest dose at which adverse effects are discernable.

NOAELs and LOAELs derived from animal studies or human data are used by the U.S. EPA to establish reference doses (RfDs) for human exposure. An RfD is a dose which is not expected to exceed an acceptable level of noncarcinogenic risk over a set duration of exposure. Uncertainty factors are incorporated into RfDs in an attempt to account for limitations in the quality or quantity of available data.

#### 3.2 ESTIMATING THE LIKELIHOOD OF ADVERSE NONCARCINOGENIC RESPONSE

The dose is the estimated amount of chemical received by the receptor. The relationship between the RfD and the received dose defines the likelihood of occurrence of adverse effects. Doses less than the RfD are not likely to be associated with any adverse health effects and are, generally, not of regulatory concern. Doses which exceed the RfD are considered to present the potential for adverse effects. Values associated with noncarcinogenic exposures are summed at the initial screening level. The relationship is expressed numerically using parameters known as the hazard value (HV) and hazard index (HI). The hazard value is obtained by dividing the average daily dose (ADD) by the RfD as presented below. The ADD is the estimated daily dose of a chemical associated with a situation-specific duration of exposure, which may not necessarily be an entire lifetime.

ADD / RfD = HV

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Each dose calculation, or combination of chemical, receptor, and exposure pathway will have a distinct hazard value. The sum of the HVs for each receptor will yield the HI, as indicated:

$$HVi + HVii + HViii + .... = HI$$

An HI value of less than one indicates that an adverse effect would not be anticipated.

#### 3.3 BACKGROUND ON CARCINOGENIC RESPONSE

The U.S. EPA has typically required that chemicals which are carcinogenic be treated as if minimum thresholds do not exist (U.S. EPA, 1986a, 1986b). The dose-response curve for carcinogens used for regulatory purposes only allows for zero risk at zero dose. Thus, for all doses, some risk is assumed to be present. To estimate the theoretical response at environmental doses, various mathematical dose-response models are used. The accuracy of the projected risk at the low environmental doses is a function of how accurately the mathematical model reflects the relationship between dose and risk at the low dose levels. The U.S. EPA uses the linearized multistage model for low dose extrapolation (Munro and Krewski, 1981). This model assumes that the effect of the carcinogenic agent on tumor formation as seen at high doses in animal data is basically the same at low doses (i.e., the slope of the dose-response curve can be extrapolated downward to the origin in a linear manner).

The U.S. EPA applied the linearized multistage model, as recommended by the Carcinogen Risk Assessment Guidelines (U.S. EPA, 1986b), to develop the upperbound estimate of the risk for the chemicals considered carcinogenic. The numerical expression of carcinogenic potency of a chemical calculated by this method is known as the "Q star", written as  $Q_1^*$ . The  $Q_1^*$  usually represents the slope of a dose-response curve derived from animal studies, but may also be based on human epidemiology. The slope is the change in tumor incidence (Y axis) over the change in dose (X axis). Thus, the units in a  $Q_1^*$  value are tumor incidence over dose level, with dose (the denominator) in milligrams of chemical per kilogram of body weight-day  $(Q_1^* = (mg/kg-day)^{-1})$ .

#### 3.4 ESTIMATING THE LIKELIHOOD OF CARCINOGENIC RESPONSE

In order to estimate the theoretical excess lifetime carcinogenic risk associated with exposure to a chemical, the product of the medium-specific (ingestion, inhalation) carcinogenicity slope factor (CSF) and lifetime average daily dose (LADD) estimated for each exposure pathway of concern is determined. The calculation of the theoretical excess lifetime cancer risk is then:

LADD 
$$x CSF = Risk.$$

#### 3.5 BENCHMARK VALUES FOR CHEMICALS OF CONCERN

The RfDs and CSFs and descriptions of the principal studies on which they are based are presented below for each of the chemicals of concern found at the site. These values are summarized in Table 3-1 and are based on the most recent U.S. EPA Integrated Risk Information System (IRIS) toxicity assessments (1992a). For MIBK, the values used for the reference doses are based on the Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) since the health risk assessment information contained in IRIS is not finalized.

Principal studies are those that contribute most significantly to the qualitative assessment. Principal studies are of two types: studies of human populations (epidemiologic investigations) and studies using laboratory animals. The presence of human data obviates the necessity of extrapolating from animals to humans. Therefore, human studies, when available, are given first priority. However, for most chemicals, there is a lack of appropriate information on effects in humans. In these cases, the principal studies are drawn from experiments on rats, mice or similar species.

#### **■ METHYLENE CHLORIDE**

Methylene chloride has been classified by the U.S. EPA as a probable human carcinogen (Group B2). IRIS (U.S. EPA, 1992a) provides cancer potency estimates for both the oral and inhalation routes of exposure. IRIS also provides an oral reference dose for methylene chloride. The Health Effects Assessment Summary Tables (U.S. EPA, 1992b) provide an inhalation reference concentration.

#### Derivation of the Oral Cancer Slope Factor

IRIS presents the 10<sup>-6</sup> risk-specific dose of methylene chloride as 7.5 x 10<sup>-3</sup> (mg/kg-day)<sup>-1</sup>. Neither of the studies of chemical factory workers exposed to methylene chloride showed an excess of cancers (Ott et al., 1983; Friendlander et al., 1978; Hearne and Friendlander, 1981). The Ott et al. (1983) study was designed to examine cardiovascular effects, and consequently the study period was too short to allow for latency of site-specific cancers. The Friendlander et al. (1978) study was recently updated to include a larger cohort, followed through 1984, and an investigation of possible confounding factors (Hearne et al., 1986, 1987). A nonsignificant increase in pancreatic cancer deaths was reported. This was interpreted by U.S. EPA (1987) as neither clear evidence of carcinogenicity in humans, nor evidence of noncarcinogenicity. Lifetime exposure at high toxic doses in animal studies have indicated carcinogenic effects from both oral and inhalation exposure to methylene chloride (NCA, 1982, 1983). Two inhalation studies with methylene chloride have reported an increased incidence of benign mammary tumors in both sexes of Sprague-Dawley (Burek et al., 1984) and F344 (NTP, 1986a) rats. Male Sprague-Dawley rats were reported to have increased salivary gland sarcoma (Burek et al., 1984) and female F344 rats were reported to have increased leukemia incidence (NTP, 1986a).

#### Derivation of the Inhalation Cancer Slope Factor

IRIS presents the inhalation unit risk for methylene chloride as  $4.7 \times 10^{-7} \text{ ug/m}^3$ . Conversion of this factor to an inhalation cancer slope factor yields a value of  $1.7 \times 10^{-3} \text{ (mg/kg-day)}^{-1}$ . The slope factor was calculated assuming a 70 kg human body weight,  $20 \text{ m}^3$  air inhaled per day and 100% absorption of inhaled methylene chloride.

A number of studies have been conducted to determine the potential for carcinogenicity of methylene chloride. The data are equivocal due to varying experimental design and quality, however a number of studies which were conducted for lifetime exposures at high doses have reported positive results (Burek et al., 1984; Dow Chemical Co., 1982).

#### - Derivation of the Chronic Oral Reference Dose

The RfD for methylene chloride is  $6.0 \times 10^{-2}$  mg/kg-day (U.S. EPA, 1992a). This value was derived from a 24-month chronic toxicity and oncogenicity study of methylene chloride in rats.

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The chosen study was conducted with 85 rats/sex at each of four nominal dose groups (i.e., 5, 50, 125 and 250 mg/kg-day) for 2 years. A high-dose recovery group of 25 rats/sex, as well as two control groups of 85 to 50 rats/sex, was also tested. Many effects were monitored. Treatment related histological alterations of the liver were evident at nominal doses of 50 mg/kg-day or higher. The low nominal dose of 5 mg/kg-day was chosen as the NOAEL (NCA, 1982).

#### -- Derivation of the Inhalation Reference Dose

HEAST (1992) lists a chronic reference concentration for methylene chloride of 3.0 mg/m³ based on an inhalation study with rats. This concentration was converted to an inhalation reference dose of 0.86 mg/kg-day. This conversion assumes a 70 kg human body weight, 20 m³ of air inhaled per day and 100% absorption of inhaled methylene chloride. This dose is based on a two year study in which rats were intermittently exposed to methylene chloride in air (Nitschke et al., 1988). The critical effect identified in this study was liver toxicity, and a NOAEL of 694.8 mg/m³ was established.

#### **XYLENE**

Xylene is not classified as a human carcinogen by the U.S. EPA. IRIS provides an oral reference dose for the evaluation of noncancer health effects.

#### -- Derivation of the Chronic Oral Reference Dose

IRIS (U.S. EPA 1992a) lists an oral reference dose for xylene (xylenes-mixed) as 2.0 mg/kg-day based on an animal study (NTP, 1986b).

Rats and mice were given gavage doses of 0, 250, or 500 mg/kg-day (rats) and 0, 500, or 1000 mg/kg-day (mice) 5 days/week for 103 weeks. The animals were observed for clinical signs of toxicity, body weight gain, and mortality. All animals that died or were killed at sacrifice were given gross necropsy and comprehensive histologic examinations. There was a dose-related increased mortality rate in male rats, and the increase was significantly greater only in the high-dose group as compared with controls. Many of the early deaths were caused by gavage error. There were no compound-related histopathologic lesions in any of the treated rats or mice. Therefore, the high dose was chosen as the LOAEL and the low dose a NOAEL.

IRIS (U.S. EPA, 1992a) does not list an inhalation reference dose for xylene (xylenes-mixed). An inhalation reference dose of 2.0 mg/kg-day was used in this assessment based on the oral reference dose.

#### ■ ETHYLBENZENE

Ethylbenzene is not classified as a carcinogen by the U.S. EPA (1992a). IRIS does provide an oral reference dose and inhalation reference concentration for the evaluation of noncancer health effects.

#### -- Derivation of the Chronic Oral Reference Dose

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for ethylbenzene as  $1.0 \times 10^{-1}$  mg/kg-day based on a subchronic rat oral bioassay (Wolf et. al., 1986).

The chosen study was a rat 182-day oral bioassay in which ethylbenzene was given 5 days/week at doses of 13.6, 136, 408, or 680 mg/kg-day in olive oil gavage. The criteria considered in judging the toxic effects on the test animals were growth, mortality, appearance and behavior, hematologic findings, terminal concentration of urea nitrogen in the blood, final average organ and body weights, histopathologic findings, and bone marrow counts. The LOAEL of 408 mg/kg-day is associated with histopathologic changes in the liver and kidney.

#### -- Derivation of the Inhalation Reference Dose

IRIS lists a reference concentration for ethylbenzene as 1.0 mg/m³ based on animal inhalation studies. Conversion of this factor to an inhalation reference dose yields a value of 0.29 mg/kg-day. The RfD was calculated assuming a 70 kg human body weight, 20 m³ of air inhaled per day, and 100% absorption of inhaled ethylbenzene.

Inhalation reproductive toxicity studies were conducted with rats and rabbits exposed 6 to 7 hours/day, 7 days/week during days 1-19 and 1-24 of gestation, respectively, to nominal concentrations of 0, 100, or 1000 ppm (434 or 4342 mg/m³; Andrew and Bushbom, 1981). A separate group of rats was exposed pregestationally for 3 weeks prior to mating and exposure was continued into the gestational period. The results of the rabbit study led to the selection of a NOAEL of 100 ppm based on a lack of developmental effects in the animals.

#### ■ METHANOL

Methanol is not considered a carcinogenic chemical by the U.S. EPA (1992a). IRIS provides an oral reference dose for the evaluation of noncancer health effects.

#### -- Derivation of the Chronic Oral Reference Dose

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for methanol as  $5.0 \times 10^{-1}$  mg/kg-day based on animal studies. IRIS does not list an inhalation reference dose for methanol. An inhalation reference dose of  $5.0 \times 10^{-1}$  mg/kg-day was used in this risk assessment based on the oral reference dose.

The U.S. EPA Office of Solid Waste, under the RCRA Land Disposal Ban, sponsored the 90-day subchronic testing of methanol in rats (U.S. EPA, 1986c). Rats were gavaged daily with 0, 100, 500, or 2500 mg/kg-day of methanol. There were no differences between dosed animals and controls in body weight gain, food consumption, gross or microscopic evaluations. Elevated levels of SPGT, and increased, but not statistically significant, liver weights in both male and female rats suggest possible treatment-related effects in rats dosed with 2500 mg methanol/kg/day despite the absence of supportive histopathologic lesions in the liver. Based on these findings, 500 mg/kg-day of methanol was selected as a NOAEL in rats.

#### **■ TOLUENE**

The U.S. EPA has not classified toluene as a human carcinogen. IRIS lists both an oral reference dose and inhalation reference concentration for this chemical.

#### Derivation of the Chronic Oral Reference Dose

IRIS (U.S. EPA, 1992a) lists an oral reference dose for toluene as 0.2 mg/kg-day based on a National Toxicology Program study (NTP, 1989).

A subchronic gavage study was conducted in rats. Rats received toluene in corn oil at dosage levels of 0, 312, 625, 1250, 2500, or 5000 mg/kg-day. The NOAEL for this study is 312 mg/kg-day based on liver and kidney weight changes in male rats at 625 mg/kg. Because the exposure was for 5 days/week, this dose is converted to  $312 \times 5/7 = 223$  mg/kg. The LOAEL is 625 mg/kg, which is 446 mg/kg-day when converted.

#### -- Derivation of the Inhalation Reference Dose

IRIS lists an inhalation reference concentration for toluene of 0.4 mg/m<sup>3</sup> based on an occupational study. Conversion of this concentration to an inhalation reference dose yields 0.11 mg/kg-day.

Foo et al. (1990) conducted a cross-sectional study involving 30 exposed female workers employed at an electronic assembly plant where toluene was emitted from glue. Toluene levels reported in the study were from personal monitoring. Exposed workers breathed toluene air levels of 88 ppm and control workers 13 ppm. Eight neurobehavioral tests were administered to all exposed and control workers. Group means revealed statistically significant differences in six out of eight tests; all tests showed that the exposed workers performed poorly compared with the control cohort. Based on the Foo study, a LOAEL of 88 ppm was established based on neurobiological changes from chronic exposure.

#### **■** METHYLISOBUTYL KETONE (MIBK)

#### -- Derivation of the Chronic Oral Reference Dose

The Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) list a chronic oral reference dose for methylisobutyl ketone as  $5.0 \times 10^{-2}$  mg/kg-day and an inhalation reference dose as  $2.0 \times 10^{-2}$  mg/kg-day. The oral and inhalation reference doses for MIBK are under review by an EPA work group. Therefore, health risk information contained in IRIS is not currently available. MIBK is not listed as a suspect or defined carcinogen in either IRIS or HEAST.

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TABLE 3-1
BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	(mg/kg-day) <sup>-1</sup>	(mg/kg-day) <sup>-1</sup>
Xylene	2.0 E+0	2.0 E+0 <sup>1</sup>	NA <sup>2</sup>	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	8.6 E-1	7.5 E-3	1.7 E-3

<sup>&</sup>lt;sup>1</sup> In the absence of an inhalation reference dose, the oral reference dose was used.

References:

U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

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<sup>&</sup>lt;sup>2</sup> NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

#### 4.0 EXPOSURE ASSESSMENT

Exposure assessment, as defined by the National Academy of Sciences (NAS, 1983), is the process of measuring or estimating the intensity, frequency, and duration of human exposure to an agent in the environment. "In its most complete form, exposure assessment should describe the magnitude, duration, schedule, and route of exposure; the size, nature, and classes of the populations exposed; and the uncertainties in all estimates" (NAS, 1983). Accordingly, this section of the risk assessment discusses the manner in which the chemicals of concern may be distributed in the environment and the estimated frequency of contact between potential human receptors and the chemicals. The quantitative assessment of exposure, based on the chemical concentrations present in the soil or other media of concern, and the degree of absorption of the chemical, provides the basis for estimating chemical uptake (dose) and associated health risks.

#### 4.1 CONCEPT OF DOSE

The "Average Daily Dose" (ADD) or "Lifetime Average Daily Dose" (LADD) of each chemical is the exposure parameter of concern for long-term exposure durations, such as might be considered to occur in the area surrounding the facility. The ADD typically characterizes exposures which are relatively long in duration, such as over a working lifetime. The ADD is used as a standard measure of duration for characterizing long-term noncarcinogenic effects, and does not necessarily incorporate a lifetime duration of exposure. The LADD addresses exposures which may occur over varying durations from a single event to an average 70-year human lifetime. The LADD is an estimate of the daily dose of a chemical associated with any particular exposure situation or duration. The LADD characterizes exposures associated with evaluations of the likelihood of occurrence of carcinogenic endpoints.

#### 4.2 EXPOSURE DOSE AND ABSORPTION

The ADD or LADD that would be received by the receptor is estimated from exposure and absorption. According to the U.S.EPA (1989), exposure is defined as contact of a receptor to a chemical or physical agent. The level of risk associated with exposure to a chemical is always dependent on the degree of systemic absorption or uptake (i.e., dose). Exposure, in this case, is the product of chemical concentrations and medium-specific factors. For example, in the case of inhalation, the medium-specific factor is air volume breathed. The LADD presents the average daily dose (considered absorbed according to U.S.EPA, 1989) of a chemical over the entire 70 year lifetime, considering the fraction of each duration unit, such as a day, week, month, or year. After calculation of the concentrations of the chemical in each medium, the LADD for each chemical received by the receptor due to each route of exposure is calculated.

#### 4.3 PATHWAYS AND ROUTES OF HUMAN EXPOSURE

Exposure pathways are the means through which a receptor may come into contact with a chemical in the environment (e.g., skin contact with soil containing chemicals). An exposure pathway consists of three elements: (1) a source or chemical release from a source, (2) an exposure point of potential human contact, and (3) an exposure route at the contact point. Routes of exposure describe the

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means through which the chemical gains entry to the body via a particular pathway (e.g., dermal absorption of a soil-bound chemical). An exposure pathway is complete when all three elements are present. In this risk assessment, exposure pathways required by the OEPA are addressed quantitatively. These exceed the typically acceptable selection of exposure pathways. The following sections address the potential pathways and routes of human exposure.

#### 4.3.1 Rationale for Exclusion of Groundwater Exposure Pathways

As agreed with OEPA, four soil samples were collected and analyzed for TCLP on March 24, 1993. Constituents evaluated were ethylbenzene, methyl isobutyl ketone, methylene chloride, toluene and xylenes. Each constituent was not detected in each of the samples (limit of detection of each was  $25 \mu g/l$ ). For this reason, groundwater exposure pathways are not considered further in the risk assessment.

#### 4.4 RECEPTOR AND EXPOSURE PATHWAY SELECTION

The receptors required by OEPA were evaluated in each of the units. These include a residential adult and residential child. The exposure pathways evaluated for each of the receptors were, as required by OEPA, ingestion of soil, dermal contact with soil, inhalation of particulates, and inhalation of volatiles.

#### 4.5 BASIS FOR EXPOSURE FACTORS

Exposure factors used in dose calculations are OEPA required values (OEPA, 1991). Details of the sources of exposure factors are presented below.

#### 4.5.1 <u>Factors Used in All Pathways</u>

The following factors are consistent across the exposure pathways considered in this assessment. The values for the exposure duration and frequency for the pathways considered are as required by OEPA.

Exposure Frequency and Duration. The exposure frequency required by OEPA is 365 days for both an adult and child residential receptor. The exposure duration is 30 years for an adult residential receptor and 6 years for a child residential receptor (OEPA, 1991).

<u>Body Weight</u>. The value for average body weight of an adult is 70 kg and the value for average body weight of a child is 15 kg as required by OEPA (1991).

Averaging Time. The doses for noncarcinogenic health effects are averaged over the specific period of exposure for a given receptor. Noncarcinogenic averaging times are therefore calculated by multiplying the exposure frequency and exposure duration for the receptor. Noncarcinogenic averaging times for the adult and child respectively are 10,950 days and 2,190 days. Potential carcinogenic health effects are calculated over a lifetime of exposure; therefore, the OEPA (1991) value for average lifetime, 70 years, was used resulting in a carcinogenic averaging time of 25,550 days for both adult and child receptors.

#### 4.5.2 Factors Regarding Soil Ingestion

The following factors are incorporated into the exposure calculations of the soil ingestion pathway, as shown in Table 4-1.

Soil Ingestion Rate. Exposure to chemicals in the local environment may typically occur through ingestion of soil. For the majority of persons beyond the age of six, daily uptake of soil due to ingestion will be quite low. For the purposes of estimating exposure in this risk assessment, the OEPA (1991) required value of 100 mg/day was used to describe soil ingestion for residential adults and 200 mg/day for residential children.

### 4.5.3 Factors Regarding Dermal Contact with Soil

The following factors are incorporated into the exposure calculations of the pathway involving dermal contact with site soils, as presented in Table 4-2.

Skin Surface Area. Skin surface area available for dermal contact with soil for all receptors is as required by OEPA for the scenario for outdoor activities. Exposed skin areas are the arms, hands, and legs for a total of 8,620 cm<sup>2</sup> of exposed skin surface area for a residential adult and 3,535 cm<sup>2</sup> for a residential child (OEPA, 1991).

Soil Adherence Factor. Numerous studies have evaluated the amount of soil that is likely to be in contact with skin. Roels et al. (1980) showed that approximately 1.0 mg of soil per square centimeter of skin adheres to a child's hand after playing in and around the home. Similarly, Driver et al. (1989) reported a reasonable maximum adherence factor of 0.9 mg/cm<sup>2</sup>. Despite these, the value used in this risk assessment for describing soil adherence to skin during dermal contact is 2.11 mg/cm<sup>2</sup> as required by OEPA (1991).

#### 4.5.4 Factors Regarding Inhalation of Airborne Particles

The following factors are incorporated into the exposure calculations of the particulate inhalation pathway, as presented in Table 4-3.

<u>Inhalation Rate</u>. OEPA (1991) requires a daily inhalation rate of 20 m<sup>3</sup>/day for residential exposures. This gives an average inhalation rate of 0.83 m<sup>3</sup>/hour.

Exposure Time. OEPA (1991) requires that both adult and child residential exposures are 24 hours/day for 365 days per year.

#### 4.5.5 Factors Regarding the Inhalation of Volatiles from Soil

The following factors are incorporated into the exposure calculations of the inhalation of volatiles from soils as presented in Table 4-4.

<u>Inhalation Rate</u>. Ohio EPA guidance (1991) provides a daily inhalation rate of 0.83 m<sup>3</sup>/hr for residential exposure.

Exposure Time. Ohio EPA guidance (1991) provide a daily exposure time of 24 hours/day.

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#### 4.6 CHEMICAL ABSORPTION FACTORS

Chemicals which are contained in a soil matrix and which are contacted by a human receptor are generally not completely absorbed by the receptor. A certain portion of the chemical dose to which the receptor is exposed may not actually be bioavailable. Generally an absorption factor is applied to risk calculations to account for this. Absorption factors may be applicable for gastrointestinal, dermal and respiratory routes of contact. For dermal contact in particular, the amount of chemical actually absorbed through the skin is generally much less than the total chemical dose present in soil contacting the skin. Default absorption factors of 100% have been used for gastrointestinal and respiratory absorption in this risk assessment, even though in many cases, the actual values associated with these factors are far less than 1.0. For the purposes of dermal exposure to contaminated soil, absorption factors of 25% for volatile organic chemicals, 10% for semivolatile organic compounds, and 1% for inorganic compounds (Ryan et al., 1987) are used based on OEPA guidance (1991).

#### 4.7 AIRBORNE PARTICULATE CONCENTRATIONS OF CHEMICALS

Receptors could be exposed through inhalation pathways to chemicals present in the air. This exposure could occur if chemicals contained in a soil matrix are inhaled as soil particulate emissions.

There are two physical phenomena which could produce soil particulate emissions at the site: wind erosion and mechanical disturbances. Wind erosion is typically considered the less significant of these two pathways and even during construction activities contributes only a minor portion to the total particulate emissions from a site (U.S. EPA, 1985). The analysis of potential air exposures assesses constituents migrating from the soils into the atmosphere. OEPA (1991) states that this demonstration should include emission calculations and "safe inhalation levels" based on U.S. EPA and OEPA established exposure levels.

In order to estimate the concentrations of airborne particulates present during construction or digging activities, a theoretical box model was utilized (U.S. EPA, 1973, 1974). The box model is a relatively simple approach which uses conservative assumptions designed to evaluate inhalation exposure to site-associated chemicals. The following conservative assumptions are incorporated into this model:

- The source is infinitely wide in the cross-wind direction;
- The receptor is in the source area at the downwind edge;
- Vertical dispersion has resulted in uniform mixing of the particles from the ground to the breathing zone; and
- No chemicals have dispersed higher than the breathing zone.

Air concentrations of particulates are calculated by assuming the particles enter a box which is the length of the downwind dimension of the area of concern and the height of an average person. The particles in this box are assumed to be uniformly distributed within it and displaced at the downwind end by fresh air moving at a speed WS (a conservative wind speed of 9000 meters/hr or 2.5 m/sec is considered for the assessment).

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The box model estimates particle concentrations based on the following equation:

$$PB = GR \times L \times \frac{1}{WS} \times \frac{1}{H}$$

Where:

PB = Particle concentration in box  $(mg/m^3)$ ;

GR = Particle generation rate (373 mg/m<sup>2</sup>-hr);

L = Downwind length of contaminated area (area specific);

WS = Wind speed (9000 meters/hr); and

H = Height of box (2 meters)

The factors used in the box model calculation are presented in Table 4-5.

In order to calculate the concentration of a specific chemical in the air from the concentration of particulates, a highly conservative approach is incorporated that the concentration of a chemical contained in the airborne particles is the same as the concentration in area soils, as shown in the following equation:

$$CA = PB \times CS \times CF$$

Where:

CA = Chemical concentration in airborne particulates (mg/m<sup>3</sup>)

PB = Particle concentration in box  $(mg/m^3)$ 

CS = Chemical concentration in soil (mg/kg)

 $CF = Conversion factor (10^{-6} \text{ kg/mg})$ 

Table 4-6 presents the concentration of chemicals in air as a result of particulate mobilization for each of the site areas.

#### 4.8 SOIL-TO-AIR VOLATILIZATION MODEL

The volatilization factor model (VF) was used for defining the relationship between the concentration of chemicals in soil and the volatilized chemicals in air. This relationship was established as part of the Hwang and Falco (1986) model developed by EPA's Exposure Assessment Group (U.S. EPA, 1986d).

The VF presented in this section assumes that the chemical concentration in the soil is homogeneous from the soil surface to the depth of concern. This calculation is presented in Table 4-7. Factors incorporated into this model are presented in Table 4-8 and the concentration of volatile chemical emissions from soil predicted from this model are presented in Table 4-9.

TABLE 4-1
INGESTION OF CHEMICALS IN SOIL

EXPOSURE FACTORS				
Symbol	Factor	Value		
CS	Chemical Concentration in Soil	Area specific (mg/kg)		
IR	Ingestion Rate	100 mg/d - adult; 200 mg/d - child		
CF	Conversion Factor	10 <sup>-6</sup> kg/mg		
FI	Fraction Ingested	1.0 (unitless)		
EF	Exposure Frequency	365 days/year		
ED	Exposure Duration	30 yrs - adult; 6 yrs - child		
BW	Body Weight	70 kg - adult; 15 kg - child		
ΑŤ	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)		

Calculation: Dose  $(mg/kg-day) = CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$ 

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TABLE 4-2
DERMAL CONTACT WITH CHEMICALS IN SOIL

	EXPOSURE FACTORS				
Symbol	Factor	Value			
CS	Chemical Concentration in Soil	Area specific (mg/kg)			
CF	Conversion Factor	10 <sup>-6</sup> kg/mg			
SA	Skin Surface Area	$8,620 \text{ cm}^2$ - adult; $3,535 \text{ cm}^2$ - child			
AF	Adherence Factor	2.11 mg/cm <sup>2</sup>			
ABS	Absorption Factor	Chemical Specific <sup>1</sup> (unitless)			
EF	Exposure Frequency	365 days/year			
ED	Exposure Duration	30 yrs - adult; 6 yrs - child			
BW	Body Weight	70 kg - adult; 15 kg - child			
АТ	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)			

Calculation: Dose (mg/kg-day) = CS x CF x SA x ABS x AF x EF x ED x 1/BW x 1/AT

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For dermal exposure to chemicals in soil, chemical-specific values are 0.25 for volatile organic compounds, 0.1 for semi-volatile organic compounds, and 0.01 for inorganic compounds (OEPA, 1991; Ryan et. al., 1987).

TABLE 4-3
INHALATION OF CHEMICALS IN AIRBORNE PARTICULATES

	EXPOSURE FACTORS				
Symbol	Factor	Value			
CA	Chemical Concentration in Air	Calculated (mg/m <sup>3</sup> ) with Box Model (See 4.8)			
IR	Inhalation Rate	0.83 m <sup>3</sup> /hr			
ET	Exposure Time	24 hours/day			
EF	Exposure Frequency	365 days/year			
ED	Exposure Duration	30 yrs - adult; 6 yrs - child			
BW	Body Weight	70 kg - adult; 15 kg - child			
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)			

Calculation: Dose (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT

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TABLE 4-4
INHALATION OF VOLATILE CHEMICALS FROM SOIL

EXPOSURE FACTORS				
Symbol Factor Value		Value		
CA	Chemical Concentration in Air	Calculated using Volatilization Model (see 4.14)		
IR	Inhalation Rate	0.833 m <sup>3</sup> /hr		
ET	Exposure Time	24 hrs/day		
EF	Exposure Frequency	365 days/yr		
ED	Exposure Duration	30 yrs - adult; 6 yrs - child		
BW	Body Weight	70 kg adult; 15 kg child		
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)		

Calculation: Dose  $(mg/kg-day) = CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$ 

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**TABLE 4-5** 

## FACTORS USED IN THE BOX MODEL CALCULATION OF AIRBORNE PARTICULATE CONCENTRATIONS

Symbol	Factor	Value	Comments
GR	Particle Generation Rate	373 mg/m <sup>2</sup> hr	1.2 tons/mo/acre (U.S. EPA, 1985)
L	Length of Area	Incinerator Area = 30.5m South Pad = 85.3m West Pad = 36.6m	Refer to Figure 2-1
WS	Wind Speed	9000 m/hr	Conversion of 2.5 m/sec
H	Height of Box	2m	Approximate height of a person

Particulate Concentration in Air = GR x L x 1/WS x 1/H

Chemical Concentration in Air  $(mg/m^3)$  = Particulate Concentration  $(mg/m^3)$  x Chemical Concentration in Soil (mg/kg) x  $10^{-6}$  kg/mg.

Example: Incinerator Area, Xylene

Particulate Concentration in Air =  $373 \text{ mg/m}^2\text{hr} \times 30.5 \text{ m} \times 1/9000 \text{ m/hr} \times 1/2 \text{ m} = 0.632 \text{ mg/m}^3$ 

Chemical Concentration in Air =  $0.632 \text{ mg/m}^3 \text{ x } 4.0 \text{ mg/kg x } 10^{-6} \text{ kg/mg} = 2.52 \text{ x } 10^{-6} \text{ mg/m}^3$ 

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TABLE 4-6
CONCENTRATION OF CHEMICALS IN AIRBORNE PARTICULATES

Chemical	Concentration of Chemical in Soil (mg/kg)	Concentration of Chemical in Airborne Particulates (mg/m³)
Incinerator Area		
Xylene	4.00	2.52 x 10 <sup>-6</sup>
Ethylbenzene	2.00	1.27 x 10 <sup>-6</sup>
Methylene Chloride	4.00	2.52 x 10 <sup>-6</sup>
South Pad		
Xylene	8.00	1.41 x 10 <sup>-5</sup>
Ethylbenzene	2.00	3.54 x 10 <sup>-6</sup>
MIBK	0.006	1.06 x 10 <sup>-8</sup>
Toluene	21.00	3.71 x 10 <sup>-5</sup>
Methylene Chloride	3.00	5.30 x 10 <sup>-6</sup>
West Pad		
Xylene	2.20	1.39 x 10 <sup>-6</sup>
Ethylbenzene	0.229	$1.45 \times 10^{-7}$
Methanol	0.988	7.50 x 10 <sup>-7</sup>
Toluene	1.34	8.47 x 10 <sup>-7</sup>

Airborne particulate chemical concentrations calculated from the Box Model and soil concentrations; refer to Table 4-5.

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TABLE 4-7
SOIL-TO-AIR VOLATILIZATION MODEL CALCULATION

Symbol	Factor (Units)	Value		
VF	volatilization factor (m <sup>3</sup> /kg)	Chemical and Site Specific		
LS	length of side of contaminated area (m)	Incinerator Area = 30.5m; South Pad = 85.3m; West Pad = 36.6m;		
V	wind speed in mixing zone (m/sec)	2.5 m/sec		
DH	diffusion height (m)	2 m		
А	area of contamination (cm <sup>2</sup> )	Incinerator Area = $11,152,416 \text{ cm}^2$ ; South Pad = $31,226,766 \text{ cm}^2$ ; West Pad = $2,788,104 \text{ cm}^2$ ;		
$D_{ei}$	effective diffusivity (cm <sup>2</sup> /sec)	$D_{i} \times E^{0.33}$		
D <sub>ei</sub> E	true soil porosity (unitless)	0.35		
K <sub>as</sub>	soil/air partition coefficient (g soil/cm <sup>3</sup> air)	(H/K <sub>d</sub> ) x 41, where 41 is a units conversion factor		
P <sub>s</sub>	true soil density or particulate density (g/cm <sup>3</sup> )	2.65 g/cm <sup>3</sup>		
Т	exposure interval (sec)	$7.9 \times 10^8 \text{ sec}$		
$D_{i}$	molecular diffusivity (cm <sup>2</sup> /sec)	chemical-specific		
Н	Henry's law constant (atm-m <sup>3</sup> /mol)	chemical-specific		
K <sub>d</sub>	soil-water partition coefficient (cm <sup>3</sup> /g)	chemical-specific		
K <sub>oc</sub>	organic carbon partition coefficient (cm <sup>3</sup> /g)	chemical-specific		
oc	organic carbon content of soil (fraction)	0.031 - Lyman, 1983		

Values for E and  $P_s$  are from EPA 1988a, and EPA 1988b.

#### Calculation:

VF (m<sup>3</sup>/kg) = 
$$\frac{\text{(LS x V x DH)}}{A}$$
 x  $\frac{(3.14 \text{ x } \alpha \text{ x T})^{1/2}}{(2 \text{ x D}_{ei} \text{ x E x K}_{as} \text{ x } 10^{-3} \text{ kg/g})}$ 

where:

$$\alpha \text{ (cm}^2/\text{s)} = \frac{\text{(D}_{ei} \text{ x E)}}{\text{E} + (P_s)(1-\text{E})/K_{as}}$$

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TABLE 4-8
CHEMICAL-SPECIFIC VALUES INCORPORATED INTO THE SOIL-TO-AIR VOLATILIZATION MODEL

Chemical	D <sub>i</sub>	Н	K <sub>d</sub>	K <sub>oc</sub>	D <sub>ei</sub>	K <sub>as</sub>	α
Toluene	4.2E-05	0.0067	4.681	151	3.0E-05	0.059	3.6E-07
Ethylbenzene	1.5E-06	0.0066	7.967	257	1.0E-06	0.034	7.0E-09
Xylene	5.5E-05	0.0053	49.135	1585	3.8E-05	0.004	3.1E-08
Methanol	1.3E-05	0.0076	3.906	126	8.9E-06	0.080	1.4E-07
MIBK	2.5E-06	0.0043	11.532	372	1.7E-06	0.015	5.3E-09
Methylene Chloride	1.1E-06	0.0020	27.001	871	7.9E-07	0.003	4.8E-10

Factors obtained from Lyman et.al., (1982) <u>Handbook of Chemical Properties;</u> CRC (1990) <u>Handbook of Chemistry and Physics;</u> Perry (1990) <u>Chemical Engineers</u> <u>Handbook;</u> Montgomery and Welkom (1990) <u>Groundwater Chemicals Desk Reference.</u>

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TABLE 4-9
CONCENTRATION OF VOLATILE CHEMICAL EMISSIONS FROM SOIL

AREA & CHEMICAL	CONCENTRATION IN SOIL (mg/kg)	VAPOR CONCENTRATION (mg/m <sup>3</sup> )					
Incinerator Area							
Xylene	4.0	3.0 x 10 <sup>-6</sup>					
Ethylbenzene	2.0	7.1 x 10 <sup>-7</sup>					
Methylene Chloride	4.0	3.7 x 10 <sup>-7</sup>					
South Pad							
Xylene	8.0	7.2 x 10 <sup>-6</sup>					
Ethylbenzene	2.0	8.5 x 10 <sup>-7</sup>					
MIBK	0.006	1.8 x 10 <sup>-9</sup>					
Toluene	21.0	6.4 x 10 <sup>-5</sup>					
Methylene Chloride	3.0	3.3 x 10 <sup>-7</sup>					
West Pad							
Xylene	2.2	4.9 x 10 <sup>-7</sup>					
Ethylbenzene	0.229	2.4 x 10 <sup>-8</sup>					
Methanol	0.988	5.0 x 10 <sup>-7</sup>					
Toluene	1.34	1.0 x 10 <sup>-6</sup>					

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#### 5.0 RISK CHARACTERIZATION

Risk characterization is the description of the nature and the magnitude of the potential for occurrence of adverse health effects under a specific set of conditions. In this section the criteria identified in the dose-response assessment (Section 3) are compared with the uptake (dose) values presented in the exposure assessment (Section 4).

The toxicity and exposure assessments are summarized and integrated into quantitative expressions of risk. To characterize potential noncarcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. To characterize potential carcinogenic effects, the theoretical probability that an individual will develop cancer over a lifetime of exposure is estimated from conservative projected intakes and chemical-specific dose-response information. The purpose of risk characterization is to present the data that provide a conclusion with regard to the nature and extent of the risk. This section presents a discussion of the risks calculated for each of the three units.

#### 5.1 APPROACH

For each exposure pathway, theoretical excess lifetime cancer risks were calculated for chemicals of concern which are considered carcinogens by the U.S. EPA (methylene chloride). Hazard values were calculated for all of the chemicals which could potentially pose noncarcinogenic hazards: xylene, ethylbenzene, MIBK, toluene, methanol, and methylene chloride. The noncancer hazard value is based on the assumption that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. The individual theoretical excess cancer risk assumes a lifetime of exposure to putative carcinogens.

According to OEPA guidance (1991), carcinogens detected at the site must not exceed the upperbound cancer probability of  $1 \times 10^{-6}$  (one chance in one million for a theoretical extra case of cancer). For summed noncarcinogens detected at the site, the total exposure hazard index is required to be below unity. As required by OEPA, calculated risks were added between hazardous constituents and summed across all routes of exposure for each unit.

#### 5.2 RISK CHARACTERIZATION FOR RECEPTORS AND AREAS OF CONCERN

The results of the risk characterization for each unit are presented below.

The health effects calculation tables are organized in the following manner:

- Tables are in numerical order corresponding to area of concern and receptor as follows: Former Liquid Waste Incineration Area, South Pad and West Pad, residential adult, residential child.
- Tables are also in numerical order corresponding to specific pathway as follows: ingestion of soil, dermal contact with soil, inhalation of particulates, inhalation of volatiles from soil, and combined hazard index and lifetime cancer risks.

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#### 5.3 SUMMARY OF POTENTIAL FOR ADVERSE EFFECTS

Table 5-1 presents the summed hazard indices and theoretical excess cancer risks associated with each of the receptors for each unit. Tables 5-2 through 5-7 present the noncancer hazard indices and theoretical excess lifetime cancer risks associated with each exposure pathway and each chemical by unit.

## **Incinerator Area**

Tables 5-8 through 5-12 present the likelihood of adverse effects associated with the residential adult for this area and Tables 5-13 through 5-17 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1 x 10<sup>-6</sup> designated by OEPA (1991) for RCRA closure. For both receptors, the combined hazard index values are lower than the acceptable benchmark of one designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the incinerator area indicate that the summed theoretical excess lifetime cancer risks are  $8.84 \times 10^{-7}$  for the adult and  $3.69 \times 10^{-7}$  for the child. The combined hazard index values are  $6.20 \times 10^{-3}$  and  $1.30 \times 10^{-2}$  for the adult and child, respectively.

# South Pad

Tables 5-18 through 5-22 present the likelihood of adverse effects associated with residential adult for this area and Tables 5-23 through 5-2 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1 x 10<sup>-6</sup> designated by OEPA (1991) for RCRA closure. For both receptors, the summed hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the South Pad area indicate that the summed theoretical excess lifetime cancer risks are  $6.62 \times 10^{-7}$  for adult and  $2.77 \times 10^{-7}$  for the child. The combined hazard index values are  $1.42 \times 10^{-2}$  for the adult and  $3.19 \times 10^{-2}$  for the child.

### West Pad

Tables 5-28 through 5-32 present the likelihood of adverse effects associated with the residential adult and Tables 5-33 through 5-37 present the likelihood of adverse effects associated with a residential child.

Theoretical excess lifetime cancer risks were not calculated for this area, since the chemicals of concern were not putative carcinogens. For both receptors the combined hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991). The results for the West Pad area indicate that the combined hazard index values are  $8.57 \times 10^{-4}$  for the adult and  $1.92 \times 10^{-3}$  for the child.

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TABLE 5-1
SUMMARY OF COMBINED HAZARD INDICES
AND THEORETICAL EXCESS LIFETIME CANCER RISKS

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	6.20 E-03	8.84 E-07
Child/Incinerator Area	1.30 E-02	3.69 E-07
Adult/South Pad	1.42 E-02	6.62 E-07
Child/South Pad	3.19 E-02	2.77 E-07
Adult/West Pad	8.57 E-04	NA
Child/West Pad	1.92 E-03	· NA

NA - No putitive carcinogenic chemicals detected in this area

TABLE 5-2

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE INCINERATOR AREA

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	Adult	1.36E-04	0.00E+00
	Child	2.86E-04	0.00E+00
Ethylbenzene	Adult	1.50E-03	0.00E+00
	Child	3.18E-03	0.00E+00
Methylene Chloride	Adult	4.57E-03	8.84E-07
	Child	9.53E-03	3.69E-07

Attachment E 04512-04-A

TABLE 5-3

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE INCINERATOR AREA

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks	
Ingestion of Chemicals in	Adult	1.27E-04	1.84E-08	
Soil	Child	1.18E-03	3.43E-08	
Dermal Contact with	Adult	5.76E-03	8.35E-07	
Chemicals in Soil	Child	1.10E-02	3.20E-07	
Inhalation of Chemicals	Adult	2.92E-06	6.29E-10	
on Airborne Particulates	Child	1.36E-05	5.87E-10	
Inhalation of Chemicals	Adult	1.25E-06	7.70E-11	
from Vapors from Soil	Child	5.81E-06	7.16E-11	

TABLE 5-4

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE SOUTH PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Xylene	Adult	2.73E-04	0.00E+00
	Child	5.77E-04	0.00E+00
Ethylbenzene	Adult	1.49E-03	0.00E+00
	Child	3.16E-03	0.00E+00
MIBK	Adult	8.96E-06	0.00E+00
	Child	2.00E-05	0.00E+00
Toluene	Adult	9.01E-03	0.00E+00
	Child	2.10E-02	0.00E+00
Methylene Chloride	Adult	3.42E-03	6.62E-07
	Child	7.13E-03	2.77E-07

TABLE 5-5

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE SOUTH PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Ingestion of Chemicals	Adult	2.56E-04	1.38E-08
in Soil	Child	2.39E-03	2.57E-08
Dermal Contact with	Adult	1.16E-02	6.26E-07
Chemicals in Soil	Child	2.23E-02	2.40E-07
Inhalation of Chemicals	Adult	1.03E-04	1.10E-09
on Airborne Particulates	Child	4.83E-04	1.03E-09
Inhalation of Chemicals	Adult	1.67E-04	6.93E-11
from Vapors from Soil	Child	7.80E-04	6.47E-11

TABLE 5-6

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE WEST PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks	
Xylene	Adult	7.44E-05	0.00E+00	
	Child	1.56E-04	0.00E+00	
Ethylbenzene	Adult	1.65E-04	0.00E+00	
	Child	3.48E-04	0.00E+00	
Methanol	Adult	8.22E-05	0.00E+00	
	Child	2.06E-04	0.00E+00	
Toluene	Adult	5.35E-04	0.00E+00	
	Child	1.21E-03	0.00E+00	

TABLE 5-7

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE WEST PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Ingestion of Chemicals	Adult	1.72E-05	0.00E+00
in Soil	Child	1.61E-04	0.00E+00
Dermal Contact with	Adult	7.07E-04	0.00E+00
Chemicals in Soil	Child	1.35E-03	0.00E+00
Inhalation of Chemicals	Adult	3.46E-06	0.00E+00
on Airborne Particulates	Child	1.62E-05	0.00E+00
Inhalation of Chemicals	Adult	3.03E-06	0.00E+00
from Vapors from Soil	Child	1.41E-05	0.00E+00

Residential Adult Incinerator Area

Table 5-8

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)~1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	5.71E-06 2.86E-06 5.71E-06	2.00E+00 1.00E-01 6.00E-02	2.86E-06 2.86E-05 9.52E-05	2.45E-06 1.22E-06 2.45E-06	NA NA 7.50E-03	  1.84E-08
Summed:					1.27E-04			1.84E-08

Residential Adult Incinerator Area

Table 5-9

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	2.60E-04 1.30E-04 2.60E-04	2.00E+00 1.00E-01 6.00E-02	1.30E-04 1.30E-03 4.33E-03	1.11E-04 5.57E-05 1.11E-04	NA NA 7.50E-03	  8.35E-07
Summed:					5.76E-03			8.35E-07

Residential Adult Incinerator Area Table 5-10

#### Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	3.03E-06 1.52E-06 3.03E-06	8.63E-07 4.32E-07 8.63E-07	2.00E+00 2.90E-01 8.60E-01	4.32E-07 1.49E-06 1.00E-06	3.70E-07 1.85E-07 3.70E-07	NA NA 1.70E-03	  6.29E-10
Summed:						2.92E-06			6.29E-10

Residential Adult Incinerator Area

Table 5-11

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-l	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	3.00E-06 7.10E-07 3.70E-07	8.57E-07 2.03E-07 1.06E-07	2.00E+00 2.90E-01 8.60E-01	4.28E-07 6.99E-07 1.23E-07	3.67E-07 8.69E-08 4.53E-08	NA NA 1.70E-03	7.70E-11
Summed:					1,25E-06			7.70E-11

Residential Adult Incinerator Area

Table 5-12

#### Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks	
Xylene	1330-20-7	1.36E-04	0.00E+00	
Ethylbenzene	100-41-4	1.50E-03	0.00E+00	
Methylene Chloride	75-09-2	4.57E-03	8.84E-07	
Summed:		6.20E-03	8.84E-07	

Residential Child Incinerator Area

Table 5-13

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	5.33E-05 2.67E-05 5.33E-05	2.00E+00 1.00E-01 6.00E-02	2.67E-05 2.67E-04 8.89E-04	4.57E-06 2.29E-06 4.57E-06	NA NA 7.50E-03	  3.43E-08
Summed:					1.18E-03			3.43E-08

Residential Child Incinerator Area

Table 5-14

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	4.97E-04 2.49E-04 4.97E-04	2.00E+00 1.00E-01 6.00E-02	2.49E-04 2.49E-03 8.29E-03	4.26E-05 2.13E-05 4.26E-05	NA NA 7.50E-03	  3.20E-07
Summed:					1.10E-02			3.20E-07

Residential Child Incinerator Area Table 5-15

#### Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	3.03E-06 1.52E-06 3.03E-06	4.03E-06 2.01E-06 4.03E-06	2.00E+00 2.90E-01 8.60E-01	2.01E-06 6.95E-06 4.68E-06	3.45E-07 1.73E-07 3.45E-07	NA NA 1.70E-03	  5.87E-10
Summed:						1.36E-05			5.87E-10

Residential Child . Incinerator Area

Table 5-16

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	3.00E-06 7.10E-07 3.70E-07	3.98E-06 9.43E-07 4.91E-07	2.00E+00 2.90E-01 8.60E-01	1.99E-06 3.25E-06 5.71E-07	3.41E-07 8.08E-08 4.21E-08	NA NA 1.70E-03	  7.16E-11
Summed:					5,81E-06			7.16E-11

Residential Child Incinerator Area

Table 5-17

## Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.86E-04	0.00E+00
Ethylbenzene	100-41-4	3.18E-03	0.00E+00
Methylene Chloride	75-09-2	9.53E-03	3.69E-07
Summed:		1.30E-02	3.69E-07

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Residential Adult South Pad

Table 5-18

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.14E-05	2.00E+00	5.71E-06	4.90E-06	NA	
Ethylbenzene	100-41-4	2.00E+00	2.86E-06	1.00E-01	2.86E-05	1.22E-06	NA	
MIBK	95-50-1	6.00E-03	8.57E-09	5.00E-02	1.71E-07	3.67E-09	NA	
Toluene	108-88-3	2.10E+01	3.00E-05	2.00E-01	1.50E-04	1.29E-05	NA	
Methylene Chloride	75-09-2	3.00E+00	4.29E-06	6.00E-02	7.14E-05	1.84E-06	7.50E-03	1.38E-08
Summed:					2.56E-04			1.38E-08

Residential Adult South Pad Table 5-19

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	5.20E-04	2.00E+00	2.60E-04	2.23E-04	ΝA	***
Ethylbenzene	100-41-4	2.00E+00	1.30E-04	1.00E-01	1.30E-03	5.57E-05	NA	
MIBK	95-50-1	6.00E-03	3.90E-07	5.00E-02	7.79E-06	1.67E-07	NA	
Toluene	108-88-3	2.10E+01	1.36E-03	2.00E-01	6.82E-03	5.85E-04	NA	
Methylene Chloride	75-09-2	3.00E+00	1.95E-04	6.00E-02	3.25E-03	8.35E-05	7.50E-03	6.26E-07
Summed:	•				1.16E-02			6.26E-07

Residential Adult South Pad Table 5-20

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.41E-05	4.02E-06	2.00E+00	2.01E-06	1.72E-06	NA	
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	1.01E-06	2.90E-01	3.47E-06	4.31E-07	NA	
MIBK	95-50-1	6.00E-03	1.06E-08	3.02E-09	2.00E-02	1.51E-07	1.29E-09	NA	
Toluene	108-88-3	2.10E+01	3.71E-05	1.06E-05	1.10E-01	9.60E-05	4.53E-06	NA	
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	1.51E-06	8.60E-01	1.75E-06	6.47E-07	1.70E-03	1.10E-09
Summed:						1.03E-04			1.10E-09

Residential Adult South Pad

Table 5-21

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	2.04E-06	2.00E+00	1.02E-06	8.74E-07	NA	~-
Ethylbenzene	100-41-4	8.48E-07	2.42E-07	2.90E-01	8.35E-07	1.04E-07	NA.	
MIBK	95-50-1	1.83E-09	5.23E-10	2.00E-02	2.61E-08	2.24E-10	NA	
Toluene	108-88-3	6.36E-05	1,82E-05	1.10E-01	1.65E-04	7.78E-06	NA	
Methylene Chloride	75-09-2	3,33E-07	9.51E-08	8.60E-01	1.11E-07	4.08E-08	1.70E-03	6.93E-11
Summed:					1.67E-04			6.93E-11

Residential Adult South Pad Table 5-22

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.73E-04	0.00E+00
Ethylbenzene	100-41-4	1.49E-03	0.00E+00
MIBK	95-50-1	8.96E-06	0.00E+00
Toluene	108-88-3	9.01E-03	0.00E+00
Methylene Chloride	75-09-2	3.42E-03	6.62E-07
Summed:		1.42E-02	6.62E-07

Residential Child South Pad Table 5-23

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.07E-04	2.00E+00	5.33E-05	9.14E-06	NA	det vale
Ethylbenzene	100-41-4	2.00E+00	2.67E-05	1.00E-01	2.67E-04	2.29E-06	NA	
MIBK	95-50-1	6.00E-03	8.00E-08	5.00E-02	1.60E-06	6.86E-09	NA	
Toluene	108-88-3	2.10E+01	2.80E-04	2.00E-01	1.40E-03	2.40E-05	NA	
Methylene Chloride	75-09-2	3.00E+00	4.00E-05	6.00E-02	6.67E-04	3.43E-06	7.50E-03	2.57E-08
Summed:					2.39E-03			2.57E-08

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Residential Child South Pad

Table 5-24

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	9.95E-04	2.00E+00	4.97E-04	8.52E-05	NA	
Ethylbenzene	100-41-4	2.00E+00	2.49E-04	1.00E-01	2.49E-03	2.13E-05	NA	
MIBK	95~50-1	6.00E-03	7.46E~07	5.00E-02	1.49E-05	6.39E-08	NA	
Toluene	108-88-3	2.10E+01	2.61E-03	2.00E-01	1.31E-02	2.24E-04	NA	
Methylene Chloride	75-09-2	3.00E+00	3.73E-04	6.00E-02	6.22E-03	3.20E-05	7.50E-03	2.40E-07
Summed:					2.23E-02			2.40E-07

Residential Child South Pad

**Table 5-25** 

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Yerl am a	1330-20-7	8.00E+00	1.41E-05	1.88E-05	2.00E+00	9.39E-06	1.61E-06	МА	
Xylene									
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	4.69E-06	2.90E-01	1.62E-05	4.02E-07	NA	
MIBK	95~50-1	6.00E-03	1.06E-08	1.41E-08	2.00E-02	7.04E-07	1.21E-09	NA	
Toluene	108-88-3	2.10E+01	3.71E-05	4.93E-05	1.10E-01	4.48E-04	4.23E-06	NA	
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	7.04E-06	8.60E-01	8.19E-06	6.04E-07	1.70E-03	1.03E-09
Summed:						4.83E-04			1.03E-09

Residential Child South Pad

Table 5-26

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	9.52E-06	2.00E+00	4.76E-06	8.16E-07	NA	
Ethylbenzene	100-41-4	8.48E-07	1.13E-06	2.90E-01	3.90E-06	9.69E-08	NA.	
MIBK	95-50-1	1.83E-09	2.44E-09	2.00E-02	1.22E-07	2.09E-10	NA	
Toluene	108-88-3	6.36E-05	8.48E-05	1.10E-01	7.71E-04	7.27E-06	NA	
Methylene Chloride	75-09-2	3.33E-07	4.44E-07	8.60E-01	5.16E-07	3.80E-08	1.70E-03	6.47E-11
Summed:					7.80E-04			6.47E-11

Residential Child South Pad

Table 5-27

Combined Hazard Index and Lifetime Cancer Risks

		Combined Hazard	Theoretical Excess Lifetime
Compound	CAS No.	Index	Cancer Risks
Xylene	1330-20-7	5.77E-04	0.00E+00
Ethylbenzene	100-41-4	3.16E-03	0.00E+00
MIBK	95-50-1	2.00E-05	0.00E+00
Toluene	108-88-3	2.10E~02	0.00E+00
Methylene Chloride	75-09-2	7.13E-03	2.77E-07
Summed:		3.19E-02	2.77E-07

Residential Adult West Pad Table 5-28

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
V-3	1000 50 7					4 457 56		
Xylene	1330-20-7	2.20E+00	3.14E-06	2.00E+00	1.57E-06	1.35E-06	NA	
Ethylbenzene	100-41-4	2.29E-01	3.27E-07	1.00E-01	3.27E-06	1.40E-07	NA	
Methanol	67-56-1	9.88E-01	1.41E-06	5.00E-01	2.82E-06	6.05E-07	NA	
Toluene	108-88-3	1.34E+00	1.91E-06	2.00E-01	9.57E-06	8.20E-07	NA	
Summed:					1.72E-05			0.00E+00

Residential Adult West Pad

Table 5-29

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.43E-04	2.00E+00	7.15E-05	6.12E-05	NA	
Ethylbenzene	100-41-4	2.29E-01	1.49E-05	1.00E-01	1.49E-04	6.38E-06	NA NA	
Methanol	67-56-1	9.88E-01	2.57E-05	5.00E-01	5.13E-05	1.10E-05	NA	
Toluene	108-88-3	1.34E+00	8.70E-05	2.00E-01	4.35E-04	3.73E-05	NA	
Summed:					7.07E-04			0.00E+00

Residential Adult West Pad

Table 5-30

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	0.00=100	1 (77 0)	4 369 53	0.007.100	0 070 07	0 005 03	N/A	
Ethylbenzene	100~41-4	2.20E+00 2.29E-01	1,67E-06 1,74E-07	4.75E-07	2.00E+00	2.37E-07	2.03E-07	NA NA	
-		_,		4.94E-08	2.90E-01	1.70E-07	2.12E-08	NA	
Methanol	67-56-1	9.88E-01	7.49E-07	2.13E-07	5.00E-01	4.26E-07	9.14E-08	NA	
Toluene	108-88-3	1.34E+00	1.02E-06	2.89E-07	1.10E-01	2.63E-06	1.24E-07	AM	
Summed:						3.46E-06			0.00E+00

Residential Adult West Pad

Table 5-31

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	1.40E-07	2.00E+00	7.00E-08	6.00E-08	NA	
Ethylbenzene	100-41-4	2.42E-08	6.91E-09	2.90E-01	2.38E-08	2.96E-09	NA	w
Methanol	67-56-1	5.00E-07	1.43E-07	5.00E-01	2.86E-07	6.12E-08	NA	
Toluene	108-88-3	1.02E-06	2.91E-07	1.10E-01	2.65E-06	1.25E-07	NA	
Summed:					3.03E-06			0.00E+00

Residential Adult West Pad

Table 5-32

## Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetim Cancer Risks	
Xylene	1330-20-7	7.44E-05	0.00E+00	
Ethylbenzene	100-41-4	1.65E-04	0.00E+00	
Methanol	67-56-1	8.22E-05	0.00E+00	
Toluene	108-88-3	5.35E-04	0.00E+00	
Summed:		8.57E-04	0.00E+00	

Residential Child West Pad

Table 5-33

Ingestion of Chemicals in Soil

Compound -	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.93E-05	2.00E+00	1.47E-05	2.51E-06	NA	
Ethylbenzene	100-41-4	2.29E-01	3.05E-06	1.00E-01	3.05E-05	2.62E-07	NA	
Methanol	67-56-1	9.88E-01	1.32E-05	5.00E-01	2.63E-05	1.13E-06	NA	
Toluene	108-88-3	1.34E+00	1.79E-05	2.00E-01	8.93E-05	1,53E-06	NA	
Summed:					1.61E-04			0.00E+00

Residential Child West Pad Table 5-34

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.73E-04	2.00E+00	1.37E-04	2.34E-05	NA	<del></del>
Ethylbenzene	100-41-4	2.29E-01	2.85E-05	1.00E-01	2.85E-04	2.44E-06	NA	
Methanol	67-56-1	9.88E-01	4.91E-05	5.00E-01	9.83E-05	4.21E-06	NA	
Toluene	108-88-3	1.34E+00	1.67E-04	2.00E-01	8.33E-04	1.43E-05	NA	
Summed:					1.35E-03			0.00E+00

Residential Child West Pad

Table 5-35

## Inhalation of Chemicals from Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.67E-06	2.22E-06	2.00E+00	1.11E-06	1.90E-07	NA	
Ethylbenzene	100-41-4	2.29E-01	1.74E-07	2.31E-07	2.90E-01	7.95E-07	1.98E-08	NA	
Methanol	67-56-1	9.88E-01	7.49E-07	9.95E-07	5.00E-01	1.99E-06	8.53E-08	NA	
Toluene	108-88-3	1.34E+00	1.02E-06	1.35E-06	1.10E-01	1.23E-05	1.16E-07	NA	
Summed:						1.62E-05			0.00E+00

Residential Child West Pad

Table 5-36

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	6.53E-07	2.00E+00	3.27E-07	5.60E-08	NA	
Ethylbenzene	100-41-4	2.42E-08	3.23E-08	2.90E-01	1.11E-07	2.76E-09	NA	
Methanol	67-56-1	5,00E-07	6.66E-07	5.00E-01	1.33E-06	5.71E-08	NA	
Toluene	108-88-3	1.02E-06	1.36E-06	1.10E-01	1.24E-05	1.17E-07	NA	
Summed:					1.41E-05			0.00E+00

Residential Child West Pad

Table 5-37

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.56E-04	0.00E+00
Ethylbenzene	100-41-4	3.48E-04	0.00E+00
Methanol	67-56-1	2.06E-04	0.00E+00
Toluene	108-88-3	1.21E-03	0.00E+00
Summed:		1.92E-03	0.00E+00

### 6.0 UNCERTAINTY ANALYSIS

This section qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the U.S. EPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in a real situation. Thus, the risks documented in this report are far in excess of those which would ever be anticipated to actually occur. The specific aspects of this assessment which produce those conclusions are noted below for each aspect of the risk assessment:

Representative Chemical Concentrations: OEPA (1991) requires the use of the highest detected chemical concentration as the representative concentration and the inclusion of any chemical detected above background levels in the risk assessment. This unrealistically conservative approach is in excess of that recommended by the U.S. EPA (1989b) and in excess of that required to meet the National Contingency Plan's stated goal of "protection of public health and the environment" (U.S. EPA, 1986a). The U.S. EPA typically requires the use of the 95% upper confidence limit on the arithmetic mean of a distribution of values, while the actual likelihood of exposure to chemicals is reflected in a geometric mean. The most appropriate description of exposure, and the most reflective of reality, is the use of stochastic methodologies, commonly referred to as "Monte Carlo" modeling.

<u>Likelihood of Hypothetical Residential Land Use Actually Occurring:</u> A critical conceptual aspect of the risk assessment is the assumed future land use. OEPA specifies that a residential setting must be addressed for risk assessment parameters for closure plans (1991). The probability that a residential development would be built on the site 10 or 50 years from now is extremely small, since the current owner has operated the facility for 30 years and intends to continue operations indefinitely.

Exposure Factors: OEPA has required that all chemicals detected in each area and their maximum concentrations be incorporated into the risk assessment. Considering a 30- year residential lifetime, it is difficult to conceive of a situation in which an individual would ingest soil, touch soil, inhale volatiles, inhale particulates every day for that period. Each factor incorporated into the quantitative analysis of those exposures is at or above the 95% upper limit of the range of possible values for that factor. Thus, the hypothetical individual in question is at the 95% level for exposure in every conceivable manner. This exceeds the U.S. EPA's intent to achieve an analysis based on "reasonable maximum exposure" (1989b) and is not consistent with a real possibility for exposure. In addition, the summation of multiple factors at the 95% level leads to a summed conclusion value that is far in excess of 95%, and is likely to reach the 99.99% percentile.

Chemical Fate and Transport: A number of aspects of actual human exposure to chemicals in the environment are not accommodated in OEPA guidance. During a 30 year lifetime of exposure, assuming the chemical source is removed, chemical concentrations in any medium will decrease in a specific location. This may be due to biotic degradation, abiotic degradation, or attenuation (dispersion). The rate of decrease will be due to a multitude of environmental factors such as air, soil, or water conditions, chemical-specific factors such as volatility, solubility, or soil mobility, and physical conditions, such as sunlight. The resulting

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lower chemical concentrations will result in lower doses to exposed receptors. In many cases, modeling may incorporate factors to account for this loss, however, it was not incorporated into this assessment.

<u>Dose-Response</u>: Regulatory approaches to risk assessment have required the identification of toxic potency factors for chemicals. For non-carcinogens, a hazard value has been identified on a chemical-specific basis. For putative carcinogens, the "cancer slope factor" has been used to derive an estimate of cancer potency. Because the slope factor is an upper 95th percentile confidence limit of the probability of a response based usually on experimental animal data, the resulting carcinogenic risk estimate will also be an upper-bound estimate. This means that the "true risk" will not exceed the risk estimate derived through the use of this model. This highly conservative approach will safely not produce an underestimate of the risk, however, even the Carcinogen Assessment Group of U.S. EPA (1986b) estimates that the lower limit of risk may be as low as zero. When biological factors are further considered, the best estimate of the risk at very low levels is often zero (Ames, 1987; Ames and Gold, 1991; USOMB, 1991).

### 7.0 CONCLUSION

The results for the three areas of concern, the Incinerator Area, the South Pad and the West Pad incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are below the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991), even with the incorporation of the unrealistically conservative approaches required by OEPA. No subsequent evaluation or post-closure monitoring is recommended.

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# ATTACHMENT F

PCB Documentation/Certification

Regarding PPG Industries, Inc. (PPG) Partial Closure Plan for three drum storage areas and the liquid incinerator at the Circleville facility, Ohio EPA issued comments concerning the proposed revision to the Plan in letters dated November 20, 1991 (Comment 2) and dated June 28, 1991 (Comment 2). In order to obtain an approvable closure plan, PPG must demonstrate to Ohio EPA's satisfaction that polychlorinated biphenyl (PCB) levels recorded in these areas are unrelated to RCRA activities, and PPG must provide a statement certifying that none of the hazardous wastes handled at the units contained PCBs.

The results of the PPG's investigation into this matter are organized as follows:

- Since waste characterization is often achieved by knowledge of the process generating the waste, a synopsis of the resin manufacturing process and associated wastes and the relationship of how PCBs were used in the facility is given first.
- The results of the investigation into historical waste analysis reports follows.
- Finally, a summary of analyses of current waste streams consistent with the wastes that were historically stored at the units to be closed is presented.

### Resin Manufacturing Process

In the resin manufacturing process, monomers, organic acids, initiators, inhibitors, catalysts, glycols or solvents are combined in a reactor vessel to undergo reactions to form polymers. Some reactions require application of heat to the reactor to produce the desired reaction.

In cases where heat from steam jacketing of the reactor vessel is insufficient, oil is used as a heat transfer media to the reactor jacket because the oil can be heated to a higher temperature than steam. PCB oil (Aroclor 1248) was used for this heat transfer media because of its safety in terms of fire resistance. When the toxicity of PCBs became known, the PCB oil in this system was replaced with non-PCB oil. In early 1972, the hot oil systems at the PPG Circleville facility were drained into a tank truck and the fluid was transported offsite for processing. The systems were flushed with solvent and this material was transferred into a tank truck and transported off site for incineration. Non-PCB heat transfer oil (Therminol 66) was used to fill the systems.

The diagram in Attachment 1 shows an example of the application of the hot oil for heat transfer in the process. When calling for heat on the reactor, hot oil is pumped by the hot oil circulating pump from the furnace through the hot oil piping and through the reactor jacket which is mounted externally to the reactor vessel and then back to the furnace. When the reactor is calling for cooling, the oil flow is diverted by a valve through the cold oil loop. It is cooled in the cool oil fans (air cooled heat exchanger) and recirculated to the reactor jacket.

Another application of heat from the hot oil system is to the reboiler at the partial condenser unit. In this case, hot oil from the furnace is pumped through a tubed heat exchanger which is the reboiler. In both cases, hot oil does not make contact with the product. The heat from the hot oil system is released to the product through the wall of the vessel or through the tubing surface of the reboiler.

Wastes generated from the resin manufacturing process include samples taken during and after the reaction process, wastewater extracted from the process during reflux, solvents used for flushing process vessels between batches, waste resin generated during filtration and material transfer steps. These waste streams are all from the product in the reactor system vessel which has not been combined with, or made contact with, the heat transfer oil. In terms of the generator's knowledge of the process generating these wastes, PCB compounds are not part of the process generating these wastes since PCBs have never been ingredients used in the reactors to make resin polymers.

### <u>Historical Waste Analysis</u>

Records pertinent to RCRA waste analysis were searched from 1980 to the present. In the years from 1980 to 1984, waste analysis information which was required for profile approval to dispose of wastes at commercial TSD facilities relied heavily on knowledge of the process generating the waste. Since PCBs were not used in the process materials, no analytical work was done pertaining to these compounds.

A revision to the facility Waste Analysis Plan in 1984 initiated more laboratory analysis, but PCBs were not specified in the Waste Analysis Plan and were not tested in the waste samples. The lab analysis report in Attachment 2 is typical of the lab analysis done at the time.

In 1986, a more comprehensive waste analysis program was started with analytical work performed by NUS Corporation. Lab results from this phase show that PCBs were not specifically analyzed, but a test for organic chlorine was performed on many of the waste samples. Inquiries made to the NUS laboratory indicate that the presence of a PCB compound in the sample should give a positive result on this test. In examination of these lab analysis reports, which are included as Attachment 3, the majority of reports show below the detection or quantification limit for organic chlorine. In the few reports which do show measurable organic chlorine, a correlation can be made to the presence of methylene chloride.

Analysis for PCB compounds was done in the waste analysis program by NUS in 1987. This data is included as Attachment 4. All of these reports show PCBs at less than detection except for one analytical report for a waste stream identified as Cationic Waste Resin which shows 39 mg/kg of PCB-1242. This isolated result is not in accord with the PCB compound Aroclor-1248 formerly used for heat transfer fluid at the facility. The result may be due to laboratory error, or due to the ubiquitous nature of PCBs in the environment.

### Current Waste Analyses

Since 1987, waste analytical data from receipt samples at the Energy Recovery Unit has fulfilled most of the waste analysis requirements for the Circleville plant. Analysis for PCBs is a routine part of this testing. RCRA waste streams from the Circleville manufacturing plant have not shown presence of PCBs. Attachment 5 includes annual summaries from receipt samples of all current waste streams which are comparable to those that were previously stored in the units to be closed.

The RCRA wastes previously stored at the Waste Drum Storage Areas and the comparable currently generated waste streams can be summarized as follows:

- Waste Resin, D001, (alkyd, acrylic, polyester or epoxy polymers dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene, or methyl ethyl ketone). The following current waste streams documented in Attachment 5 are comparable: CRXADRC101, CRXADRC102, CRXADRC104, CRXDRSF111, CRXODRF101, CRXODRF102.
- Spent stripper containing methylene chloride (F002).
   This waste is comparable to current waste stream identified as CRXCCLF101 in Attachment 5.
- Incinerator brick and residue generated incineration of F003 and F005 wastes. Analysis performed on samples of this material in 1988 for the purpose of evaluating this waste regarding Land Disposal Restrictions did not include analysis for PCBs. analysis that was performed is included as Attachment 6. Waste streams that were input to this incinerator did not contain PCBs. Current wastes, documented in Attachment 5, that are the same as those that were incinerated in this unit are: CRXSSLF101, CRXOCWF101, CRXODRF101, CRXODRF102.
- Waste acrylonitrile (U009). This waste stream is no longer generated in this form. Acrylonitrile is a raw material that has been used in a limited number of resin

formulas and is still used for one product manufactured at the PPG Circleville facility.

Waste toluene diisocyanate (U223). This waste is the same as current waste stream identified as CRXRMSP107 in Attachment 5.

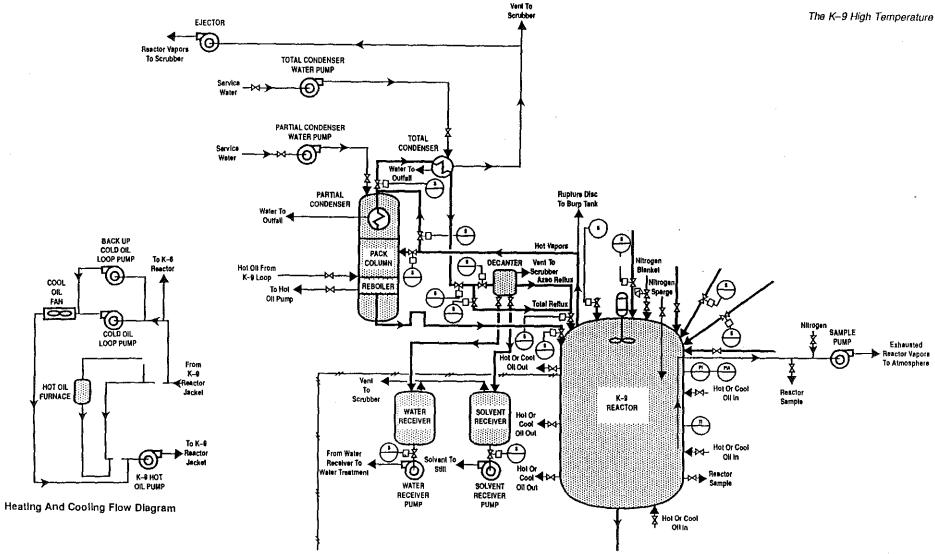
In summary, changes in resin formulation over the years have resulted in some variance in the amount of solvent constituents or the structure of resin polymers in the process wastes generated. However, these were not significant changes and the waste streams characterized in Attachment 5 are consistent with the wastes which were stored in the areas to be closed.

## Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

\_\_\_Date\_\_\_\_4/13/92\_

ATTACHMENT 1



Reacting Flows And Controls

ATTACHMENT 2



Laboratory Services Division 5350 Campbella Run Road Pittsburgh, PA 15205 REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 1527\$

412-788-1080

## LAB ANALYSIS REPORT

LIENT NAME: (BORESS:	PPB INDUSTRIES, INC. P.G.BGX 457 CIRCLEVILLE, ON 43113		NUS PROJECT NO: NUS CLIENT NO: NUS SAMPLE NO:	702820 320228 14030757
	REPOR	T DATE: 04/16/84		
I TENTION:	DAVE WEIDEL		BATE RECEIVEDS	03/19/84
	SAMPLE IDENTIFICATION: OF	F-SPEE RESIN COMPOSITE	03/12	
TEST	DETERMINATION	RESULTS	UMITS	
\$915 \$040	% Ash @ 550 C British Thermol Units	0.1 15000	Z BTW15	
\$670	Flesh Point (Pensky-Horten)	85	F	•
\$165	I Solids, total et 103 C	33.1	1	
3168	Specific Weight	7.9	12/401	
\$210	Viscosity	. <b>5</b>	CP	
\$450	Lead (Pb)	25	mg/]	
5950	Acid Digestion		-	

ATTACHMENT 3

REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

STILL SLUDGE

#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 01/11/87

NUS CLIENT NO: NUS SAMPLE NO: 321909 16110424

VENDOR NO:

01831710

HORK ORDER NO: DATE RECEIVED: 55830 11/07/86

ATTENTION:

MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-86-0086-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Berallium (Be)	( 0.2	ES/1
M140	Chronium (Cr)	⟨ 1	ms/l
<b>X200</b>	Lead (Pb) .	ន	ES/
H250	Hercury (Ha)	0.0090	<b>a</b> 4/1
0F01	Xulenes	240000	as/1
0F05	2-butanone	<b>{ 4000</b> 0	ms/1_ \
<b>0F0</b> 8	4-methyl-2-rentanone	43000	ms/1
<b>0F9</b> 9	Volatile Organic Scan		1, '
0M20	Ethyl Acetate	( 0.1	*////
OM28	Methanol /	( 0.1	x \(\)
DN48	Maleic Anhydride	( 1.0	
0H57	n-Butanol	( 0.1	
0 <b>MS8</b>	i-Butanol	( 0.1	4
0M64	Methyl Amyl Ketone	( 0.1	X .
8V06 📑	Carbon Tetrachloride ** *********************************	(*20000- \ - 4.5	<b>m4/</b> 1 -
0V19	Ethalbenzene	72000	mg/]
0V22	Methylene Chloride	( 20000	<b>as/</b> [
0V25	Toluene	29000	mg/]
UV30 ≔¥	Tricklorofluoroaethane	( <b>≽200</b> 00	<b>25/</b> 1
S015	% Ash € 550 C	(1	X.
S040	British Thermal Units	17000	8TU/15
5064	Chlorine, Orsanic	( 0.1	X
S098	Fluorine, Orsanic	( 0.01	*
S175	% Water (Karl Fisher)	0.07	X
S <b>95</b> 0	Acid Disestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
H032	Ammonia as N (distillation)	44	ms/]
<b>4435</b>	Kitrosen, Kieldahl (N)	190	rs/i
//SX440	A Nitrosen, Orsanic (M)	140	RS/
/< ¥620 pp	Solids, total at 103 C	(138000) /7.87	2 ≥5/l
N765 0	世 紀し   Total Sulfur-Gravimetric(S)	33	<b>mg/</b> ]
COMMENTS:	TEntatively Identified Compound	Estimated Result	
COUNCY 13 ( ) (	Acetic Acid, Butyl Ester	35,000	mg/l

Reviewed and Arroved by: JMC





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

### LAB ANALYSIS REPORT

REPORT DATE: 07/23/86

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

238

NUS CLIENT NO: NUS SAMPLE NO: 321909

VENDOR NO:

16051372

WENDUR NO: HORK ORDER NO: 01831710 55830

DATE RECEIVED:

05/28/86

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Berallium (Be)	(0.02	ms/1
H200	Lead (Pb)	1.9	mg/1
H250	Hercury (Hs)	( 0.02	md/l
DH03	Carbon Tetrachloride	⟨ 3.0	X
0H04	Toluene	( 0.1	X
DM05	Xulenes	( 0.1	χ
9 <b>00</b> 6	Hertanes	2.5	X.
DM10	Ethylbenzene	< 0.4	ጀ
0M23	Methal Ethal Ketone	( 0.5	X
0H24	Methyl Isobutyl Ketone	11	X.
0H32	Butal Cellosolve	3.9	X
DH44	Methylene Chloride	( 0.1	X
0M48	Maleic Anhydride	< 0.1	Z
0H57	n-Butanol	1.3	X
DM64	Methyl Amyl Ketone	( 0.1	ĭ
0M65	Petroleum Ether	⟨ 0.1	ĭ
OH71	Trichlorofluoromethane	₹ 0.4	L
S015	X Ash 8 550 C	< 0.1	X
S040	British Thermal Units	19000	BTU/1b
S064	Chlorine, Organic	< 0.1	<b>%</b>
<b>\$09</b> 8	Fluorine, Orsanic	( 0.01	z
S1 <b>9</b> 5	% Water (Karl Fisher)	2.4	Z Z
9950	Acid Disestion		
S971	Ashine		
S <b>98</b> 0	Oxygen Bomb Preparation		
H032	Ammonia as N (distillation)	53	<b>≘</b> ⊴/1
H435	Nitrosen, Kieldahl (N)	330	æg/l
H440	Mitrosen, Orsanic (M)	270	<b>₽9/1</b>
¥620	Solids, total at 103 C	168000 (	16.8%) B9/1

MENTS:

JUL 2 5 1986

ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

Reviewed and Approved by: UMC

321909

16110421

01831710

11/07/86

55830

**HUS CLIENT NO:** 

NUS SAMPLE NO:

HORK ORDER NO:

DATE RECEIVED:

VENDOR NO:

UNITS

**a**9/[ 19/1 25/1 mg/] ž ž

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BTU/18





#### LAB ANALYSIS REPORT

CLIENT HAME:

E MINATE

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA BRIVE

PITTSBURGH,

ATTENTION: NR. DAVE NAZZOCCO

PA

15238

**REPORT BATE: 01/11/87** 

MR+RO WASTE S/7

SAMPLE IDENTIFICATION: CV-86-0083-03

TEST	DETERMINATION	RESULTS
H050	Berallium (Be)	( 0.2
M140	Chronium (Cr)	₹1
<b>X200</b>	Lead (Pb)	13
M250	Mercury (Hs)	0.005
UF01	Xulenes	8.5
0F05	2-butanone	3 >
0F <b>0</b> 8	4-methyl-2-rentanone	19
0F <b>9</b> 9	Volatile Ordanic Scan	
0N20	Ethyl Acetate	( 0.1
OX2E	Methanol	⟨ 0.1
<b>3N48</b>	Maleic Anhadride	( 1.0
0257	n-Butanol	⟨ 0.1
01158	i-Butanol	0.4
0M64	Methyl Amyl Ketone	< 0.1
4.000 A. U.S.	್Carbon Tetrachloride ಕಾರ್ಯಸಹಕ್ಕಾತಿಕ ೭೦೮೮	2 4 4 . (4 "
0419	Ethylbenzene	2.6
0V22	Methylene Chloride	. (4
0V25	Toluene	1.5
0V30	Trichloroflaoroaethaae	(4
S015	X Ash & 550 C	₹1
S040	British Thermal Units	16000
S064	Chlorine, Organic	< 0.1
<b>9078</b>	Fluorine, Orsanic	( 0.01
S195	% Water (Karl Fisher)	2.1
S <b>75</b> 0	Acid Disestion	
S971	Ashins	
S <b>98</b> 0	Oxusen Bomb Preparation	
H032	Ammonia as N (distillation)	44
₹4435	Hitro≤en, Kieldahl (H)	190
H440	Nitrosen, Orsanic (N)	96
H620	Solids, total at 103 C	146000
N765	Total Sulfur-Gravimetric(S)	(1

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% NERE DETECTED.

mg/] mg/1 (B3/1

Reviewed and Approved by: JMC







### LAB ANALYSIS REPORT

CLIENT NAME:

PPS INDUSTRIES, INC.

ADDRESS:

260 KAPPA BRIVE

PITTSBURGH,

PA 15238

HUS CLIENT NO: NUS SAMPLE NO:

321909 16110423

VENDOR NO: 01831710 HORK ORDER NO:

55830

ATTENTION:

MR. DAVE MAZZOCCO

REPORT DATE: 01/11/87 SELECTRON

DATE RECEIVED:

11/07/86

SAMPLE IDENTIFICATION: CV-86-0085-03

	TEST	DETERMINATION	RESULTS	UNITS
	<b>NO50</b>	Beralliam (Be)	( 0.2	ag/l
	M140	Chromium (Cr)	<b>〈1</b>	mg/l
	M200	Lead (Pb)	( 3	as/l
	M250	Mercury (Hs)	< 0.004	m≤/]
	afo1	Xuienes	110	ad/l
	0F05	2-butanone	1600	<b>a</b> d/1
	0F08	4-methy1-2-pentanone	1200	ad/l
	OF99	Volatile Or⊴anic Scan		
	01120	Ethyl Acetate	( 0.1	7
	3M2E	Hethanol	0.1	ሂ
	-0 <b>%48</b>	Maleic Anhadride	(1.0	<b>X</b>
	0%57	n-Butano]	< 0.1	X
	8 <b>775</b> 8	i-Butanol	0.34	<b>7</b>
	BM64.	Methyl Amyl Ketone	< 0.1	X
	8V06	ರ್ಷ Carbon Tetrach Torida ಸಮಾರ್ಥವಾಗಿ 22 ಕ್ರಮ್ಮ	("40 :-	ms/t
	DV19	Ethylbenzene	₹ 40	m4/1
	8V22	Methylene Chloride	( 40	as/1
	0V25	Tolu <del>e</del> ne	64	<b>2</b> 5/1
	0A30 £	Maria Tricklorofluoromethanes	(.40	25/1
	S015	X Ash @ 550 C	(1	<b>X</b>
	S040	British Thermal Units	MMC	
	S064	Chlorine, Organic	< 0.1	<b>4</b>
	S098	Fluorine, Orsanic	( 0.01	*
	S195	% Water (Karl Fisher)	72	
	S950	Acid Disestion		
	5971	Ashins		
	S <b>78</b> 0	Oxygen Bomb Preparation		الله المعرفة ا
	H032	Ammonia as N (distillation)	1200	JAN 18 CINEERING
	¥4 <b>35</b>	Mitrosen, Kieldahl (M)	1400	JAN JAN
	N440 -	Nitrosen, Orsanic (N)	100	JAN 18 ENGINEERING  BEYN ENVIROL DEPARTMENT  ENVIRONMENTAL ENGINEERING  ENVIROLDEPARTMENT
ران د	ଂ ଖ620 👸	Solids, total at 103 C	88300	DED WINEW OF DED WIN
, `	¥765 <sup>™</sup>	Total Sulfur-Gravimetric(S)	(1	BAND FINNING ON TRUE
	TAAR HEE			ະ ຄູ∨∽

TROP YOU CONNENTS: NO VOLATILE ORGANICS > 1% HERE DETECTED. HHC INDICATES THE SAMPLE WILL NOT COMBUST.

Reviewed and Approved by: JMC





#### LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.

ATTENTION:

ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

MS. CHRIS BABKA

PΑ

15238

REPORT DATE: 07/23/86

NUS CLIENT NO: MUS SAMPLE NO:

321909 16051371

VENDOR NO:

01831710

HORK ORDER NO: 55830 DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0042-03 - Alkyd S/T Waste

TEST	DETERMINATION	RESULTS	UNITS
H050	Berallium (Be)	( 0.02	as/1
M200	Lead (Pb)	3.5	<b>29</b> /1
H250	Mercury (Hs)	( 0.02	ng/i
DM03	Carbon Tetrachloride	⟨ 0.3	7
0M04	Toluene	( 0.1	ĭ
OH05	Xulenes	1.4	7.
0M06	Hertanes	( 0.1	X.
0M10	Ethy I benzene	₹ 0.4	
9H23	Methyl Ethyl Ketone	( 0.1	r r
BH24	Methyl Isobutyl Ketone	21	7,
0H32	Butal Cellosolve	15	Z
DM44	Methylene Chloride	⟨ 0.1	%
ย <b>ห</b> 48	Maleic Anhadride	( 0.1	%
DM57	n-Butanol	0.1	γ.
0H64	Methyl Amyl Ketone	( 0.1	X
DM65	Petroleum Ether	( 0.1	X
9M71	Trichlorofluoromethane	( 0.4	X.
S015	% Ash @ 550 C	< 0.1	7,
S040	British Thermal Units	9000	BTU/15
S064	Chlorine, Organic	₹ 0.1	χ
S0 <b>9</b> 8	Fluorine, Organic	( 0.01	7
S1 <b>9</b> 5	% Water (Karl Fisher)	(10.1E) ?	χ.
9750	Acid Disestion	,	
5971	Ashins		
5780	Oxygen Bomb Preparation		
H032	Ammonia as N (distillation)	28	es/1
W435	Nitrosen, Kjeldahi (N)	740	R9/
H440	Nitrosen, Organic (N)	720	19/
W620	Solids, total at 103 C	133000	mg/l

COMMENTS:

Reviewed and Approved but UMS

ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

REMIT TO: CT Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

REPORT DATE: 07/23/86

MUS CLIENT NO: NUS SAMPLE NO: 321909 16051370

VENDOR NO:

01831710

WORK ORDER NO: **55830** DATE RECEIVED: 05/28/86

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0041-03 - Selectron Waste S/T

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	( 0.02	m5/1
M200	Lead (Pb)	3.1	<b>a</b> s/1
M250	Mercury (Hs)	0.03	ms/l
BM03	Carbon Tetrachloride	( 3.0	χ
8M04	Tolvene	( 0.1	¥
0M05	Xulenes	( 0.3	Z
0 <b>MO</b> 6	Hertanes	2,3	Z
8M10	Ethylbenzene	{ 0.7	Z
9M23	Methyl Ethyl Ketone	1.0	ž
0M24	Methai Isobutal Ketone	6,7	Z
8 <b>H3</b> 2	Butyl Cellosolve	5.8	<del>"</del>
0M44	Methylene Chloride	0.10	Ž.
DN48	Maleic Anhadride	( 0.1	ž
OM57	n-Butanoi	1.6	Ž
0M64	Methyl Amyl Ketone	( 0.1	Ÿ
0M65	Petroleum Ether	⟨ 0.1	χ
0H71	Trichlorofluoromethane	( 0.4	7
S015	% Ash € 550 C	⟨ 0.1	χ
S040	British Thermal Units	15000	ETU/16
S064	Chlorine, Organic	0.16	X
S098	Fluorine, Orsanic	( 0.01	ž
S195	% Water (Karl Fisher)	1.8	Z
S950	Acid Disestion		
S971	Ashins		
S980	Examen Bomb Preparation		
W032	Ammonia as N (distillation)	56	<b>m</b> 5/]
H435	Hitrosen, Kieldahl (H)	360	#3/)
H440	Nitrosen, Orsanic (N)	300	#4/1
W620	Solids, total at 103 E	277000	ms/!

COMMENTS:

Reviewed and Approved by: JMC

**ENVIRONMENTAL ENGINEERING** & CONTROL DEPARTMENT

A Halliburton Company



412-788-1080

### ANALYSIS REPORT

CLIENT NAME: ADDRESS:

PPG INDUSTRIES, INC.

260 KAPPA DRIVE PITTSBURGH,

PA

15238 REPURT DATE: 07/23/86 NUS CLIENT NO: NUS SAMPLE NO:

321909 16051369

VENDOR NO:

01831710

NORK ORDER NO: DATE RECEIVED: 55830 05/28/86

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0040-03 - MR & RD Waste Storage Samples

TEST	DETERMINATION	RESULTS	UHITS
H050	Berwilium (Be)	( 0.02	<u> </u>
H200	Lead (Pb)	2.2	es/i
H250	Mercury (Hg)	0.05	ms/1
DM03	Carbon Tetrachloride	( 3.0	X
8M04	Toluene	( 0.1	<b>X</b>
8M05	Xalenes	⟨ 0.1	<b>"</b>
9M04	Hertanes	2.8	Z
DM10	Ethylbenzene	⟨ 0.1	Z
0M23	Methal Ethal Ketone	1.3	X
0M24	Methyi Isobutyi Ketone	3.4	%
8M32	Butal Cellosolve	1.8	z z
0M44	Methylene Chloride	0.19	χ.
0M48	Haleic Anhadride	( 0.1	X
DM57	n-Butanol	1.6	%
DH64	Methui Amul Ketone	( 0.1	*
OH65	Petroleum Ether	( C.1	Z
0H71	Trichlorofluoromethane	( 0.4	%
S015	% Ash 8 550 C	⟨ 0.1	X
9040	British Thermal Units	15000	BTU/1b
5064	Chlorine, Orsanic	0.46	Z
S195	% Water (Karl Fisher)	3.61	X .
S950	Acid Disestion		
S971	Ashins		
5980	Oxagen Bomb Premaration		
H032	Ammonia as N (distillation)	45	ms/l
H435	Mitrosen, Kjeldahl (M)	360	ms/i
H440	Mitrosen, Organic (M)	320	<b>±</b> 5/i
N620	Solids, total at 103 C	393000	£9/]

COMMENTS:

ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

Reviewed and Approved but UMD





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

### ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

REPORT DATE: 07/23/66

NUS SAMPLE NO: VENDOR NO:

16051374

NUS CLIENT NO:

01831710

HORK ORDER NO: DATE RECEIVED: 55830 05/28/86

321909

ATTENTION:

MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-85-0048-03 - WPS-18384 (ACEYLIC RESID, HEPTANE SOLVENT)

TEST	DETERMINATION	RESULTS	UNITS
	**************************************		
S015	% Ash 8 550 C	( 0.1	Z
S064	Chlorine, Organic	( 0.1	χ
S980	Oxygen Bomb Preparation		



COMMENTS:



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

## LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 07/23/86

NUS CLIENT NO: NUS SAMPLE NO:

321909 16051372

CH ROTHBY

01831710

HORK ORDER NO:

55830

ATTENTION: MS. CHRIS BABKA

DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Berallium (Be)	( 0.02	mg/1
M200	Lead (Pb)	1.9	<b>e</b> 9/]
H250	Hercura (Hg)	( 0.02	<b>5</b> 5/1
<b>0M0</b> 3	Carbon Tetrachloride	⟨ 3.0	Z
0H04	Toluene	( 0.1	z
DM05	Xalenes	( 0.1	%
0H06	Hertanes	2.5	X
0M10	Ethylbenzene	⟨ 0.4	7.
0H23	Methal Ethal Ketone	( 0.5	
0H24	Methyl Isobutyl Ketone	11	%
9K32	Butyl Cellosolve	3.9	¥
DH44	Methylene Chloride	( 0.1	%
0M48	Haleic Anhydride	( 0.1	X.
0M57	n-Butanoi	1.3	%
0H64	Methul Amul Ketone	( 0.1	Z.
0M65	Petroleum Ether	⟨ 0.1	
0H71	Trichiorofluoromethane	( 0.4	· Z
S015	% Ash 8 550 C	· ( 0.1	Z
5040	British Thermal Units	19000	ETU/1b
5064	Chlorine, Organic	( 0.1	ž
S0 <b>9</b> 8	Fluorine, Orsanic	( 0.01	7
S195	% Water (Karl Fisher)	2.4	7.
S <b>?50</b>	Acid Disestion		
S971	Ashing		
S <b>98</b> 0	Oxygen Bomb Preparation		
H032	Ammonia as N (distillation)	53	mg/i
H435	Hitrosen, Kieldahl (M)	330	ms/1
H440	Mitrosen, Orsanic (N)	270	mg/]
H620	Solids, total at 103 C	168000	ns/}

COMMENTS:

**ENVIRONMENTAL ENGINEERING** & CONTROL DEPARTMENT

Reviewed and Approved but UMC





### ANALYSIS REPORT LAB

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA

15238

REPORT DATE: 07/23/86

NUS SAMPLE ND:

NUS CLIENT NO:

321909 16051375

VENDOR NO:

01831710

NORK ORDER NO: DATE RECEIVED: 05/28/86

55830

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0049-03 - 75-10 Floor Stripper - Used

TEST	DETERMINATION	RESULTS	UNITS
H050	Berullium (De)	( 0.02	ES/1
M200	Lead (Pb)	3.3	<b>e</b> ⊴/}
H250	Mercure (Hs)	0.11	<b>m</b> 5/1
0F01	Xulenes	2.7	Z
0F <b>0</b> 5	2-butanone	( 0.8	X.
0F08	4-methyl-2-pentanone	3.3	X
8M29	Ethanol	3.5	Z
0H32	Butsi Cellospive	0.86	%
8V19	Ethylbenzene	9.7	X
8V22	Methalene Chloride	15	%
0V25	Toluene	0.7	ey Je
DV91	Volatile Orsanic Scan		
S015	% Ash 8 550 C	1.0	Х
S040	British Thermal Units	<b>820</b> 0	BTU/16
S064	Chlorine, Orsanic	10	X
S195	% Water (Karl Fisher)	23.2	X
S <b>750</b>	Acid Disestion		
5971	Ashins		
5780	Oxygen Bomb Preparation		
H620	Solids, total at 103 C	205000	ag/]

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% HERE DETECTED.

2 5 1986 **ENVIRONMENTAL ENGINEERING** & CONTROL DEPARTMENT

Reviewed and Approved by: UMC





412-788-1080

### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

ATTENTION: HR. DAVE HAZZOCCO

PA 15238

REPORT DATE: 01/11/87

ALKYD WASTE S/T

HUS CLIENT NO: 321909 NUS SAMPLE NO: 16110422

01831710

55830

HORK ORDER NO: DATE RECEIVED: 11/07/86

VENDOR NO:

SAMPLE IDENTIFICATION: CV-86-0084-03

TEST	DETERMINATION	RESULTS	UNITS
H050	Berullium (Be)	( 0.2	as/I
M140	Chronium (Cr)	(1	ns/1
<b>%200</b>	Lead (Pb)	( 3	ms/1
H250	Hercury (Hs)	0.032	mg/1
0F01	Xulenes	94000	<b>a</b> 5/1
0F05	2-butanone	<b>4000</b> 0	<b>a</b> 4/1
0F <b>0</b> 8	4-methyl-2-rentanone	170000	<b>¥</b> ⊴/1
0F99	Volatile Organic Scan		
8 <b>X2</b> 0	Ethyl Acetate	( 0.1	7
0M28	Hethanol	0.1	X
0H48	Maleic Anhadride	( 1.0	ž
0M57	n-Butanol	⟨ 0.1	Z
UN58	i-Butanol	( 0.1	Ž
DH64	Hethyl Amyl Ketone	₹ 0.1	Z
€V06: '4-	nd - Carbon Tetrachloride f	(±20000 T	M5/1 **
0V19	Ethalbenzene	30000	ms/1
8V22	Methylene Chioride	( 20000	<b>a</b> 9/1
0V25	Toluene	23000	ms/1
<b>8</b> V30	Trichtoroffuoroaetham	( 28 <b>00</b> 0 , 🚞	- ms/f
<b>S</b> 015	X Ash 8 550 C	(1	Z
S040	British Thermal Units	16000	BTU/15
S064	Chlorine, Organic	0.3	Z
S078	Fluorine, Orsanic	0.03	ž
S195	% Water (Karl Fisher)	1.9	Z
S <b>75</b> 0	Acid Disestion		
S971	Ashins		
S <b>9</b> 80	Oxy≡en Bomb Preparation		
<b>N03</b> 2	Ammonia as N (distillation)	93	E4/]
¥435	Hitrosen, Kjeldahl (N)	310	<b>1</b> 4/1
H440	Nitrosen, Orsanic (N)	220	md/
. <b>X620</b> /	Solids, total at 103 C	112000	#5/I
N765 POT	Total Sulfor-Gravimetric(S)	2.7	<b>#4/1</b>

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 12 HERE DETECTED.

Reviewed and Approved by: JMC



Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. LOWER PHASE

#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

ATTENTION:

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

NUS SAMPLE NO:

321909 17051366

VENDOR NO:

01831710

REPORT DATE: 07/13/87

WORK ORDER NO: 55830

MR. DAVE MAZZOCCO

DATE RECEIVED:

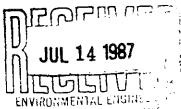
NUS CLIENT NO:

05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 LOHER PHASE

05/11

TEST	DETERMINATION	RESULTS	UNITS
H050	Beryllium (Be)	( 0.05	ms/l
H200	Lead (Pb)	1.6	<b>m</b> 5/1
M250	Mercury (Hs)	0.050	ms/l
OF01	Xylenes	( 20000	as/1
0F <b>0</b> 5	2-Butanone (MEK)	67000	as/\
DF08	4-Hethy)-2-Pentanone (MIBK)	( 40000	<b>≥</b> 9/1
<b>DF09</b>	Styrene	( 20000	ad/l
0F <b>9</b> 9	Volatile Organic Scan		
DH07	2-Butoxy ethanol	1.3	X
OM12	Kerosene	( 0.1	X.
OM29	Ethanol	1.6	7,
DM32	Butyl Cellosolve	1.1	X
0N36	Mineral spirits	⟨ 0.1	ž
DM51	Ethylene Glycol	( 0.1	Z.
DM61	Butyl Acetate	0.35	X.
DN64	Methyl Amyl Ketone	⟨ 0.1	Z.
0022	Na# tha	( 0.2	Ž
0023	Hertane	( 0.1	ž
0V22	Methylene Chloride	450000	<b>₽</b> 4/\
0V25	Toluene	( 20000	ms/)
0V27	1,1,1-Trichloroethane	( 20000	mg/]
0V28	1,1,2-Trichloroethane	⟨ 20000	mg/]
S015	% Ash at 550 C	0.1	7
S040	British Thermal Units	9610	BTU/1b
S064	Chlorine, Organic	30	7
S090	Flash Point (Pensky-Marten)	80	F
5098	Fluorine, Organic	( 0.01	ž
S168	Specific Weight	9.2	ib/gal
S195	% Water (Karl Fisher)	2.2	X
S210	Viscosity	20	 CP
5980	Oxygen Bomb Preparation		٠. د٠
¥315	Halosens, Total Orsanic (TOX)	INT	<b>A</b>





CLIENT ORIGINAL



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. LOWER PHASE

#### REPORT ANALYSIS LAB

CLIENT NAME: ADDRESS:

PPG INDUSTRIES, INC.

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

REPORT DATE: 07/13/87

VENDOR NO: WORK ORDER NO:

NUS CLIENT NO:

NUS SAMPLE NO:

17051366 01831710

321909

55830 DATE RECEIVED:

05/27/87

ATTENTION:

MR. DAVE MAZZOCCO

Toluene

**Ethylbenzene** 

SAMPLE IDENTIFICATION: CV-87-0189-03 LOHER PHASE

05/11

TEST H620 DETERMINATION

Solids, Total at 103 C

RESULTS

9800

< 20000

UNITS

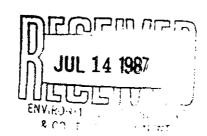
210000

mg/1 mq/1

mg/1

CAK 7/13/87





COMMENTS: Sample contained sasoline at concentration of 8.9%. INT for TOX; Sample is not soluble in water.



Park West Two Cliff Mine Road Pittsburgh, PA 15275

REMIT TO:

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. UPPER PHASE

## LAB ANALYSIS REPORT

REPORT DATE: 07/13/87

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

NUS CLIENT NO: NUS SAMPLE NO: 321909 1**705136**5

5 SAMPLE NUI

01831710

VENDOR NO: NORK ORDER NO:

55830

DATE RECEIVED:

55839 05/27/87

ATTENTION:

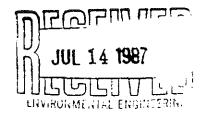
HR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE

05/11

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	( 0.05	B4/1
H200	Lead (Pb)	1.3	mg/]
M250	Mercurs (Hs)	( 0.004	ms/l
0F01	Xy 1 enes	<b>( 400</b>	<b>64/</b> ]
8F05	2-Butanone (MEK)	8200	<b>E</b> 9/1
0F08	4-Methyl-2-Pentanone (MIBK)	⟨ 800	ms/]
0F <b>0</b> 9	Styrene	( 400	ms/l
0F99	Volatile Orsanic Scan		
DM07	2-Butoxy ethanol	0.21	%
OH12	Kerosene	⟨ 0.1	χ
DH29	Ethanol	3.6	<sup>7</sup>
0132	Butyl Cellosolve	0.13	7.
0M36	Mineral spirits	( 0.1	7,
0 <del>11</del> 51	Ethylene Glycol	( 0.1	X
0M61	Butyl Acetate	{ 0.1	Z
0864	Methyl Amyl Ketone	( 0.1	Z
0022	Nartha	( 0.2	7.
0023	Hertane	⟨ 0.1	ž
0V22	Methylene Chloride	9000	ms/l
0V25	Toluene	⟨ 400	<b>m</b> 5/1
0 <b>V</b> 27	1.1.1-Trichloroethane	₹ 400	mg/l
0V28	1,1,2-Trichloroethane	( 400	ms/1
S015	% Ash at 550 C	1.4	7,
S040	British Thermal Units	1800	BTU/15
S064	Chlorine, Orsanic	0.10	X
S090	Flash Point (Pensky-Marten)	⟨ /= 70	F
S <b>07</b> 8	Fluorine, Orsanic	( 0.01	7,
S168	Specific Weight	8.4	lb/sal
5195	% Water (Karl Fisher)	62	X
S210	Viscosity	12	CP
5980	Oxygen Bomb Preparation	_	-
W315	Halosens, Total Orsanic (TOX)	17000	ua/1







REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. UPPER PHASE

#### REPORT LAB ANALYSIS

CLIENT NAME: ADDRESS:

PPG INDUSTRIES, INC.

260 KAPPA DRIVE PITTSBURGH,

PA 15238 NUS CLIENT NO:

321909

NUS SAMPLE NO:

17051365 01831710

VENDOR NO:

55830

REPORT DATE: 07/13/87

WORK ORDER NO: DATE RECEIVED:

05/27/87

ATTENTION:

MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE

05/11

TEST N620

DETERMINATION Solids, Total at 103 C RESULTS

UNITS

28100

m4/1

mg/1

CAK

Acetone Ethylbenzene Toluene

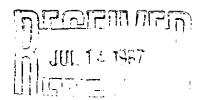
mg/1mg/1

7/13/87



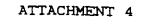
COMMENTS:

Reviewed and Approved by: JMC



PAGE NO: 2

CLIENT ORIGINAL





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

## CATIONIC WASTE RESIN

#### ANALYSIS REPORT LAB

CLIENT NAME: PPG INDUSTRIES, INC.

> ADDRESS: 260 KAPPA DRIVE

> > PITTSBURGH,

15238 PΑ

HUS CLIENT NO:

321909

NUS SAMPLE NO: **VENDOR NO:** 

17072328 01831710

HORK ORDER NO:

55830

ATTENTION: NR. DAVE NAZZOCCO REPORT DATE: 08/20/87

DATE RECEIVED:

07/30/87

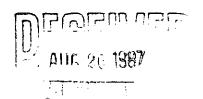
SAMPLE IDENTIFICATION: CV-87-0207-03

07/21

TEST	DETERMINATION	RESULTS	UNITS
H050	Berallium (Be)	( 0.05	<b>a</b> g/1
H140	Chronium (Cr)	⟨ 0.1	ad/i
H200	Lead (Pb)	( 0.3	as/i
M250	Hercury (Hs)	( 0.004	<b>e</b> s/1
H270	Nickel (Ni)	( 0.3	es/ì
H330	Thallium (T1)	<b>〈1</b>	ms/l
0F01	Xylenes	1100	mg/l
0F05	2-Butanone (MEK)	6300	<b>a</b> 4/1
0F <b>0</b> 8	4-Hethyl-2-Pentanone (MIBK)	3900	mg/l
0F <b>9</b> 9	Volatile Organic Scan		
OH20	Ethyl Acetate	( 1.0	us/1
0H28	Methano)	0.16	Z
0H48	Maleic Anhydride	( 0.5	X X
0 <del>115</del> 7	n-Butanol	1.2	7.
0M58	i-Butanol	( 0.2	X
ON64	Methal Amal Ketone	⟨ 0.1	γ.
0P80	Total PCBs	39	mg/kg 1242 ←
DV19	Ethylbenzene	220	<b>m</b> 5/1
0 <b>V2</b> 2	Hethylene Chloride	6400	mg/l
0V25	Toluene	₹ 200	<b>m4/</b> ]
S015	% Ash at 550 C	0.1	X .
S040	British Thermal Units	HINC	
<b>5064</b>	Chlorine, Orsanic	0.08	
S <b>09</b> 8	Fluorine, Organic	< 0.01	7,
S1 <b>9</b> 5	% Water (Karl Fisher)	60	X
S980	Oxygen Bomb Preparation		
H032	Ammonia - Distillation (as N)	6.5	ms/l
H435	Mitrosen, Kieldahl (M)	240	<b>⊪</b> ⊴/1
H440	Mitrosen, Organic (N)	230	ms/l
W765	Total Sulfur (S)—sravimetric	INT	

COMMENTS: NO ADDITIONAL VOLATILE COMPOUNDS HERE IDENTIFIED.

Reviewed and Approved by: JCS





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

#### SPEC-CATIONIC CLEANUP

#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238

REPORT DATE: 08/20/87

HORK ORDER NO: DATE RECEIVED:

**VENDOR NO:** 

17072327 01831710 55830

321909

07/30/87

ATTENTION:

HR. DAVE HAZZOCCO

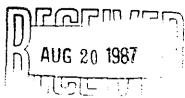
SAMPLE IDENTIFICATION: CV-87-0206-03

07/21

**NUS CLIENT NO:** 

NUS SAMPLE NO:

TEST	DETERMINATION	RESULTS	UNITS
H270	RCRA METALS	<del>- 1 /</del>	<u></u>
M030	Arsenic (As)	⟨ 0.01	<b>m</b> 9/1
M040	Barium (Ba)	(1	<b>a</b> g/1
M090	Cadmium (Cd)	⟨ 0.05	<b>m</b> 5/1
H140	Chromium (Cr)	( 0.1	ms/l
M200	Lead (Pb)	⟨ 0.3	ms/1
M250	Mercury (Hs)	0.01	ag/l
M290	Selenium (Se)	⟨ 0.04	<b>e</b> 9/1
H300	Silver (Ag)	⟨ 0.1	m4/1
H270	Nickel (Ni)	⟨ 0.3	mg/1
H330	Thallium (TI)	(1	<b>⊪</b> ⊴/1
0F01	Xylenes	180000	mg/l
0F05	2-Butanone (MEK)	( 4000	ms/l
0F08	4-Methy1-2-Pentanone (MIBK)	130000	<b>■</b> 9/}
0H32	Butal Cellosolve	50	ž
ON64	Methyl Amyl Ketone	₹ 2.0	Z.
DP80	Total PCBs	( 10	mg/kg
0V06	Carbon Tetrachloride	⟨ 2000	ms/1
OV19	Ethylbenzene	35000	<b>m</b> g/1
0V22	Methylene Chloride	₹ 2000	<b>e</b> s/1
0V25	Toluene	( 2000	as/1
<b>GV3</b> 0	Trichlorofluoromethane	( 2000	<b>m</b> 9/1
0491	Volatile Organic Analysis		
S015	X Ash at 550 C	₹ 0.1	%
S040	British Thermal Units	12200	BTU/1b
S064	Chlorine, Organic	( 0.01	X.
S098	Fluorine, Organic	( 0.01	%
S195	% Water (Karl Fisher)	. 0.4	У.
S980	Oxygen Bomb Preparation		
H032	Ammonia - Distillation (as N)	1.4	<b>m</b> g/1
H435	Nitrosen, Kjeldahl (M)	370	MS/I
H440	Nitrosen, Orsanic (N)	370	<b>e</b> 9/1



PAGE NO: 1



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

## CATIONIC FLUSHWATER

#### LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA BRIVE

PITTSBURGH,

PA 15238 NUS CLIENT NO: MUS SAMPLE NO: 321909

VENDOR NO:

17041489 01831710

55830

ATTENTION: HR. DAVE HAZZOCCO

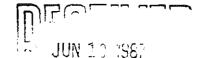
**REPORT BATE: 06/04/87** 

HORK ORDER NO: DATE RECEIVED:

04/24/87

SAMPLE IDENTIFICATION: CV-87-0172-03

TEST	DETERMINATION	RESULTS	UNITS	
M050	Berallium (Be)	( 0.05	as/1	
M140	Chromium (Cr)	⟨ 0.1	as/1	
M200	Lead (Pb)	2.6	ms/l	
M250	Mercury (Hs)	( 0.004	<b>a</b> 4/1	
OF01	Xulenes	(66)	<b>m</b> 9/1	
0F08	4-Methyl-2-Pentanone (MIBK)	1200	m4/1	
0F99	Volatile Ordanic Scan			
OM32	Butyl Cellosolve	( 0.1	X.	
OH57	n-Butanol	( 0.1	ž	
OM58	i-Butanol	⟨ 0.1	X.	
OM59	t-Butanol	( 0.1	7,	
OP80	Total PCBs	( 10	ng/kg	
DV06	Carbon Tetrachloride	( 67	ms/1	
0V22	Methylene Chloride	1700	ms/l	
0V25	Toluene	( 67	mg/l	
DV30	Trichlorofluoromethane	( 67	ms/l	
S015	% Ash at 550 C	( 0.1	X.	
S040	British Thermal Units	NNC		
S064	Chlorine, Orsanic	( 0.1	X.	
S090	Flash Point (Pensky-Marten)	> 140	F/	
S098	Fluorine, Orsanic	( 0.01	X	
S195	X Water (Karl Fisher)	56	χ	
S950	Acid Digestion			
5971	Ashins			
S980	Oxygen Bomb Preparation			
<b>H03</b> 2	Ammonia - Distillation (as N)	( 10	mg/1	
<b>H0</b> 50	BOD: 5-day (O2)	12000	<b>ag/</b> 1	
W116	Organic Carbon(non-purgeable)	13500	as/1	
H435	Nitrosen, Kjeldahl (N)	100	<b>ms/</b> 1	
H440	Nitrosen, Orsanic (N)	100	mg/]	
<b>N</b> 590	Solids: Dissolved at 180 C	5280	<b>a</b> s/1	
H610	Solids, Suspended at 103 C	380	m4/1	



PAGE NO: 1

CLIENT ORIGINAL



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

COMPOSITE OF DIRTY SOLVENT-SOUTH TANK (UPPER LAYER)

#### LAB ANALYSIS REFORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

ATTENTION:

260 KAPPA DRIVE

PITTSBURGH,

15238 PΑ

REPORT DATE: 06/18/87

MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909

NUS SAMPLE NO: **VENDOR NO:** 

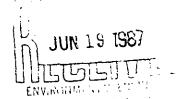
17041616 01831710

WORK DRDER NO: 55830 DATE RECEIVED: 04/28/87

04/24

SAMPLE IDENTIFICATION: CV-87-0182-03 UPPER LAYER

TEST	DETERMINATION	RESULTS	UNITS
M050	Berallium (Be)	( 0.05	<u></u>
M140	Chronium (Cr)	0.1	ms/l
H200	Lead (Pb)	( 0.3	ms/1
H250	Hercury (Hs)	0.04	mg/l
OFO1	Xulenes	360000	mg/1(34%)
OF 05	2-Butanone (MEK)	( 16000	ms/1
0F <b>0</b> 8	4-Methy1-2-Pentanone (MIBK)	120000	mg/1(40)
0F <b>99</b>	Volatile Organic Scan		
OH32	Butyl Celiosolve	3.8	<b>x</b>
OM50	Petroleum narhtha	( 1.0	<b>X</b>
GM57	n-Butanol	1.5	<b>%</b>
OM58	i-Butanol	0.4	X
ON59	t-Butanol	( 0.1	L
UN64	Methyl Amyl Ketone	(1	X
0P80	Total PCBs	( 10	mg/kg
0006	Carbon Tetrachloride	( 8000	<b>■</b> ⊴/1
0V22	Methylene Chloride	( 8000	sd/1 -
DV25	Toluene	<b>8800</b> 0	15/1 (8,890)
0V30	Trichlorofluoromethane	( 8000	mg/l
S015	% Ash at 550 C	( 0.1	X.
S040	British Thermal Units	16900	BTU/16
S064	Chlorine, Organic	⟨ 0.1	X .
5090	Flash Point (Pensky-Marten)	( /= 70	F
S098	Fluorine, Ordanic	0.02	ž
\$168	Specific Weight	6.9	lb/sal
S195	% Water (Karl Fisher)	0.2	%
S210	Viscosity	5	ĊP
5750	Acid Disestion		
5971	Ashins		
<b>5980</b>	Oxygen Bomb Preparation		
H032	Ammonia - Distillation (as N)	8	85/1 372 T
W435	Nitro≤en, Kieldahl (N)	22	19/1







**REMIT TO:** Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

COMPOSITE OF DIRTY SOLVENT-NORTH TANK (UPPER LAYER)

#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGK,

PA 15238

REPORT DATE: 06/18/87

VENDOR NO: WORK ORDER NO:

UNITS

ms/l **a**9/1 **m**4/1

ms/1 ms/1 13%

ሂ Z ሂ Z

ms/1 246

NUS CLIENT NO:

NUS SAMPLE NO:

17041618 01831710 55830

321909

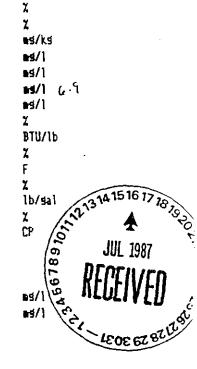
DATE RECEIVED: 04/28/87

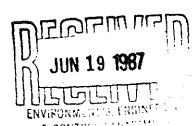
ATTENTION: MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0183-03 UPPER LAYER

04/24

TEST	DETERMINATION	RESULTS
H050	Berallium (Be)	( 0.05
H140	Chronium (Cr)	⟨ 0.1
M200	Lead (Pb)	( 0.3
H250	Hercury (Hs)	0.008
OF01	Xulenes	260000
0F <b>0</b> 5	2-Butanone (MEK)	( 8000
0F <b>0</b> 8	4-Nethyl-2-Pentanone (KIBK)	130000
OF99	Volatile Organic Scan	
0H32	Butyl Cellosolve	4.2
0H50	Petroleum narhtha	{ 1.0
0M57	n-Butanol	1.5
0M58	i-Butanol	0.5
OK59	t-Butanol	( 0.1
0864	Methyl Amyl Ketone	( 1.0
OP80	Total PCBs	( 10
0006	Carbon Tetrachloride	<b>〈 400</b> 0
0 <b>V22</b>	Methylene Chloride	( 4000
0V25	Toluene	69000
0V30	Trichlorofluoromethane	( 4000
S015	% Ash at 550 C	( 0.1
S040	British Thermal Units	17100
5064	Chlorine, Orsanic	⟨ 0.1
5090	Flash Point (Pensky-Marten)	( /= 70
S098	Fluorine, Orsanic	( 0.01
S168	Specific Weight	7.0
S195	% Water (Karl Fisher)	0.6
S210	Viscosity	5
S950	Acid Disestion	
S971	Ashins	
S980	Oxygen Bomb Preparation	
H032	Ammonia - Distillation (as N)	11
H435	Mitrosen, Kjeldahl (M)	300





PAGE NO: 1

CLIENT ORIGINAL



ATTENTION:

Laboratory Services Group 5350 Campbells Run Road Pittsburgh, PA 15205

REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

FILTER CARTRIDGES

NON-LITHARGE

## LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

MR. DAVE MAZZOCCO

PA 15238

REPORT DATE: 06/04/87

HORK ORDER NO:

VENDOR NO:

NUS CLIENT NO:

NUS SAMPLE NO:

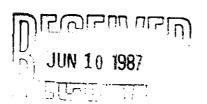
17041492 01831710

321909

55830 DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0175-03

TEST	DETERMINATION	RESULTS	UNITS
0143	TOTAL PCB'S IN SEDIMENT	<del></del>	
0E23	MLS Extraction		
0P81	Total PCBs - Soil	( 5	ag/kg
0F01	Xulenes	7100	ad/kd
DF05	2-Butanone (MEK)	( 200	ms/ks
0F08	4-Methyl-2-Pentanone (MIBK)	200	md/kd
0F <b>9</b> 9	Volatile Organic Scan		<del></del> -
101120	Ethal Acetate	( 0.1	X
DM29	Ethanol	⟨ 0.1	X
0ff32	Butal Cellosolve	1.2	x
DM64	Methyl Amyl Ketone	( 0.1	Z
ON19	n-Proryl Acetate	⟨ 0.1	χ
0006	Carbon Tetrachloride	( 100	mg/kg
0V22	Methylene Chloride	₹ 100	mg/kg
0V25	Toluene	620	ns/ks
0V30	Trichlorofluoromethane	( 100	as/ks
S271	RCRA METALS - SOLID		
S400	Arsenic (As)	⟨ 0.1	ms/ks
S410	Barion (Ba)	10	ms/ks
S420	Cadmium (Cd)	⟨ 0.5	ms/ks
S430	Chromium (Cr)	1	ms/ks
S450	Lead (Pb)	14	ag/kg
S460	Mercury (Hs)	( 0.1	<b>≥</b> g/kg
S490	Selenium (Se)	₹ 0.4	ng/kg
S500	Silver (As)	(1	∎s/ks
S950	Acid Disestion		
S010	Ammonia: Distillation (as N)	450	mg/kg
S015	% Ash at 550 C	2.9	X.
5040	British Thermal Units	11900	BTU/1b
S064	Chlorine, Orsanic	₹ 0.1	
S090	Flash Point (Pensky-Marten)	<b>&gt; 140</b>	F
S098	Fluorine, Organic	( 0.01	<b>x</b>



PAGE NO: 1



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

(MICK) CATIONIC DISTILLATE

#### LAB ANALYSIS REFORT

REPORT DATE: 06/04/87

CLIENT NAME: PPG INDUSTRIES, INC.

> ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

PA 15238 NUS CLIENT NO: NUS SAMPLE NO:

321909

17041490

VENDOR NO:

01831710

WORK ORDER NO:

55830

ATTENTION:

MR. DAVE MAZZOCCO

DATE RECEIVED:

04/24/87

SAMPLE IDENTIFICATION: CV-87-0173-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Berallium (Be)	( 0.05	ms/1
M140	Chronium (Cr)	⟨ 0.1	<b>8.5/1</b>
H200	Lead (Pb)	( 0.3	<b>a</b> s/1
H250	Hercury (Hs)	( 0.004	<b>a</b> 5/1
8FQ1	Xylenes	( 16000	<b>m</b> ≤/1
0F08	4-Methy1-2-Pentanone (MIBK)	740000	ms/1 7490
OF99	Volatile Organic Scan		
OM10	Ethylbenzene	⟨ 0.1	Z.
0N32	Butal Cellosolve	⟨ 0.1	7.
0H57	n-Butanol	2.7	X
OH58	i-Butanol	( 0.1	አ
0459	t-Butanol	⟨ 0.1	X.
<b>0P80</b>	Total PCBs	( 10	ns/ks n
<b>8V06</b>	Carbon Tetrachloride	( 16000	15/KS
0V22	Methylene Chloride	( 16000	ms/l
0V25	Toluene	<b>&lt; 1600</b> 0	<b>a</b> 4/1
0V30	Trichlorofluoromethane	( 16000	<b>a</b> 5/1
S015	X Ash at 550 C	( 0.1	X
S040	British Thermal Units	15550	BTU/1b
S064	Chlorine, Organic	⟨ 0.1	7.
5090	Flash Point (Pensky-Marten)	( /= 70	F
S098	Fluorine, Orsanic	⟨ 0.01	<b>X</b>
S195	% Water (Karl Fisher)	1.2	7.
S950	Acid Bi≰estion		
5971	Ashing		
5980	Oxygen Bomb Preparation		
H032	Ammonia - Distillation (as N)	( 10	<b>m</b> ≤/1
H050	BOD: 5-day (O2)	> 180000	<b>2</b> 9/1
W116	Orsanic Carbon(non-purseable)	INT	
H435	Nitro≤en, Kjeldahl (N)	44	<b>m</b> 5/]
H440	Nitrosen, Orsanic (N)	44	m4/l
N765	Total Sulfur (S)-gravimetric	400	<b>m</b> ≤/1

CONNENTS: NO ADDITIONAL VOLATILE ORGANICS WERE DETECTED. INT FOR TOC DUE TO SAMPLE MATRIX INTERFERENCE.

Reviewed and Approved by: JRC



Park West Two Cliff Mine Road Pittsburgh, PA 15275

REMIT TO:

412-788-1080

COMPOSITE OF SOLVENT STILL SLUDGE

#### ANALYSIS REPORT LAB

CLIENT NAME: PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA BRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 06/04/87

VENDOR NO: HORK ORDER NO:

NUS CLIENT NO:

HUS SAMPLE NO:

17041493 01831710

55830 DATE RECEIVED:

04/24/87

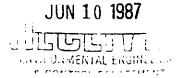
321909

ATTENTION: NR. BAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Bersllium (Be)	⟨ 0.05	#4/\
M140	Chronium (Cr)	⟨ 0.1	ad/I
M200	Lead (Pb)	( 0.3	<b>m</b> 5/1
11250	Hercury (Hs)	0.12	as/1
OF01	Xylenes	330000	a4/1
DF05	2-Butanone (MEK)	( 16000	<b>a</b> 4/1
OF08	4-Meths1-2-Pentanone (MIBK)	34000	mg/l
0F99	Volatile Organic Scan		
0H10	Ethylbenzene	9.6	X
DH32	Butal Cellosolve	( 0.1	X
OM50	Petroleum naphtha	<b>〈 1</b>	X
9M57	n-Butanol	( 0.1	X
ON58	i-Butanol	( 0.1	<b>%</b>
0H59	t-Butanol	⟨ 0.1	Z
DM64	Hethsl Amsl Ketone	( 0.1	X
0P80	Total PCBs	( 10	ms/ks
90AQ	Carbon Tetrachloride	( 8000	ms/l
0V22	Methylene Chloride	( 8000	<b>a</b> 4/1
0V25	Toluene	35000	mg/l
8V30	Trichlorofluoromethane	⟨ 8000	<b>m4/</b> ]
S015	% Ash at 550 C	( 0.1	X
S040	British Thermal Units	16700	BTU/16
5064	Chlorine, Organic	( 0.1	X X
5090	Flash Point (Pensky-Harten)	( 70	F
S098	Fluorine, Organic	⟨ 0.01	Z
S168	Secific Weisht	7.3	lb/sal
S1 <b>9</b> 5	% Water (Karl Fisher)	0.06	Z Z
S210	Viscosits	10	ርዮ
5950	Acid Disestion		
S971	Ashins		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	<sub>.</sub> 39	<b>#</b> \$/1

PAGE NO: 1





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

COMPOSITE OF SOLVENT STILL SLUDGE

#### ANALYSIS REFORT LAB

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA BRIVE

PITTSBURGH,

ATTENTION: MR. DAVE MAZZOCCO

PA

15238

REPORT DATE: 06/04/87

NUS CLIENT NO:

321909

NUS SAMPLE NO:

17041493 01831710

VENDOR NO: WORK ORDER NO:

55830

DATE RECEIVED:

04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
H435	Nitrosen, Kjeldahl (N)	5 <del>40</del>	ms/1
H440	Nitrosen, Orsanic (N)	500	ns/1
N620	Solids, Total at 103 C	97900 (9.8	70 as/1
W765	Total Sulfur (S)-gravimetric	680	<b>m4/</b> l

TENTATIVELY IDENTIFIED COMPOUNDS	ESTIMATED RESULT (mg/L)	CAK
3-Methyl Hexane	5,300	
Butyl Ester Acetic Acid	21,000	4/8/87
Unknown Alkane	35,000	

COMMENTS:

JUN 10 1987 & CONTROL DEPARTMENT

Reviewed and Approved by: JMC





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

WASTE RESIN

#### LAB ANALYSIS REFORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 06/04/87

NUS SAMPLE NO: **VENDOR NO:** 

NUS CLIENT NO:

321909 17041494

01831710 55830

HORK ORDER NO: DATE RECEIVED: 04/24/87

ATTENTION:

MR. DAVE NAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0181-03

TEST	DETERMINATION	RESULTS	UNITS	
N050	Beryllium (Be)	⟨ 0.05	<b>=</b> ≤/1	
N140	Chromium (Cr)	⟨ 0.1	ad/l	
H200	Lead (Pb)	( 0.3	mg/l	
M250	Hercurs (Hs)	0.006	<b>a</b> \$/1	
OF 99	Volatile Organic Scan			
0M32	Butyl Cellosolve	⟨ 0.1	χ.	
OP80	Total PCBs	₹ 10	ms/ks	
9006	Carbon Tetrachloride	₹ 8000	<b>m</b> 4/]	
0V22	Methylene Chloride	⟨ 8000	mg/l	
0V25	Toluene	<del>9200</del> 0	<b>m</b> 5/1	
0V30	Trichlorofluoromethane	( 8000	∎s/l	
S015	% Ash at 550 C	⟨ 0.1	X	
S040	British Thermal Units	16000	BTU/1b	
S064	Chlorine, Orsanic	( 0.1	ĭ	
S <b>09</b> 0	Flash Point (Pensky-Marten)	( /= 65	F	
S098	Fluorine, Organic	⟨ 0.01	χ	
S168	Specific Weight	7.4	lb/sal	
S195	% Water (Karl Fisher)	3.5	X	
S210	Viscosity	10	CP	
<b>\$950</b>	Acid Disestion			
S971	Ashins			
5980	Oxysen Bomb Preparation			
H032	Ammonia - Distillation (as N)	17	ms/l	
H435	Nitrogen, Kjeldahl (N)	370	<b>a</b> 4/1	
H440	Nitrosen, Orsanic (N)	350	⊪s/l	
H620	Solids: Total at 103 C	113000	<b>m</b> ⊴/1	
H765	Total Sulfur (S)-gravimetric	420	ms/l	
IDENTIF	IED COMPOUNDS	RESULT (mg/L)		
4-Methy	1-2-Pentanone	42,000		
Ethylbe	nzene	59,000		
Total X		230,000		
	VELY IDENTIFIED COMPOUNDS	ESTIMATED RESU	LT (mg/L)	CAK
COMMENTS: Hexane,	3-Methyl-	6,300		
	Acid, Butyl Ester	13,000		48/87

Reviewed and Approved by: JMC

ATTACHMENT 5

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		NO DHIH	WHS FOORD		
DATA FIELD	MIN	MAX	AVG	STD DEV	
PER CENT TOT. SOLIDS	17-01	45.07	27,10	7.760	
PER CENT ASH	0.01	0.55			
PER CENT WATER	48.31				
	10101	01.2.1	00.00	71 120	
ORGANIC HALOGEN %	0.01	0.80	0.43	0.290	
ORGANIC NITROGEN %	0.14	0.99			
ORGANIC SULFUR %	0.01	0.46			
	0.01	0.40	0.11	0.100	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	0.00	2.20	0.63	0.730	
BERYLLIUM	0.00	0.00			
CADMIUM	0.00	1.10			
CHROMIUM	0.00	4.60			
LEAD	0.00	269.00		79.570	
MERCURY	0.00	0.00			
SELENIUM	0.00	0.00			
SILVER	0.00	3.50			
ALUMINUM	0.00	64.90			
ORGANIC CONSTITUENTS :		5,.,0	17,07	17,100	
MEK	0.00	2.00	0.97	0.620	
1-BUTANOL	0.00	0.10			
MIBK	0.00	9.40			
TOLUENE	0.00	0.30			
BUTYL ACETATE	0.00	0.70			•
ETHYL BENZENE	0.00	0.50			
XYLENE	0.00	2.30		0.720	
BUTYL CELLOSOLVE	0.10	9.20			
CELLO. ACETATE	0.00	0.00			
DEG.METHYL ETHER	0.00	0.00			
HEXYL CELLOSOLVE	0.00	2.10			
ISOPHORONE	0.00	0.00			
	0.00	1.80		0.512	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK	0.00	0.10	0.00		
ETHYL ACETATE	0.00	0.00	0.00	0.031	
ISOBUTYL ACETATE	0.00	0.00		0.000	
ALIPHATIC HYDROCAR			0.00	0.000	
ALKYL BENZENES		0.00	0.00	0.000	
ISOBUTANOL	0.00	0.80	0.13	0.270	
ETHYLENE GLYCOL	0.00	0.10	0.01	0.031	
FCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
	0.00	2.80	0.31	0.880	
METHYLENE CHLORIDE TDI		0.90	0.27	0.330	
11/1	0.00	0.00	0.00	0.000	

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	<u>MAX</u>	<u>AVG</u>	STD DEV	
PHYSICAL PROPERTIES			•	•	
VISCOSITY	35	440	119	117.280	
TOT. SETT. SOLIDS	0.01	0.01	0.01	0.000	
HEATING VALUE	143	8864	5344	2862.490	
FLASH FOINT	78.00	136.00	85.25	19.180	
WEIGHT/GALLON	8.18	8.78	8.41	0.200	
рH	5.50	7.00	6.33	0.530	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD MIN <u>AVG</u> STD DEV MAX PER CENT TOT. SOLIDS 12.67 63.79 51.38 14.280 PER CENT ASH 0.140 0.00 0.37 0.10 PER CENT WATER 27.92 27.92 27.92 0.000 ORGANIC HALOGEN % 0.00 0.19 0.07 0.050 ORGANIC NITROGEN % 0.00 0.19 0.08 0.060 ORGANIC SULFUR % 0.01 0.040 0.13 0.04 HEAVY METALS (ppm) ARSENIC 0.00 0.00 0.00 0.000 BARIUM 0.00 1.91 1.660 4.60 BERYLLIUM 0.00 0.00 0.000 0.00 0.10 0.52 0.387 CADMIUM 1.40 CHROMIUM 0.00 2.30 0.74 0.614 0.00 3.640 LEAD 12.10 1.67 0.00 MERCURY 0.00 0.00 0.000 SELENIUM 0.00 0.00 0.00 0.000 SILVER 0.00 2.10 0.730 0.61ALUMINUM 0.00 32.10 18.00 10.090 ORGANIC CONSTITUENTS % 0.00 8.270 MEK 22.20 3.70 0.000 1-BUTANOL 0.00 0.00 0.00 MIBK 0.00 2.00 0.38 0.730 0.00 TOLUENE 0.20 0.03 0.075 BUTYL ACETATE 0.00 0.40 0.07 0.149 ETHYL BENZENE 0.00 0.90 0.150.335 XYLENE 0.00 4.30 0.72 1.600 BUTYL CELLOSOLVE 0.00 1.60 0.35 0.590 CELLO. ACETATE 0.00 0.00 0.00 0.000 DEG.METHYL ETHER 0.00 0.00 0.00 0.000 HEXYL CELLOSOLVE 0.00 0.00 0.00 0.000 ISOPHORONE 0.00 0.00 0.00 0.000 DEG. BUTYL ETHER 0.00 0.40 0.08 0.146 NAPHTHALENE 0.00 0.00 0.00 0.000 MAK 0.00 0.00 0.000.000 ETHYL ACETATE 0.00 0.00 0.00 0.000 ISOBUTYL ACETATE 0.00 0.000.00 0.000 ALIPHATIC HYDROCAR 0.00 2.50 0.42 0.930 ALKYL BENZENES 0.00 2.00 0.33 0.750 ISOBUTANOL 0.00 0.400.070.149 ETHYLENE GLYCOL 0.000.00 0.00 0.000FCB'S 0.00 0.00 0.00 0.000ETHYL CELLOSOLVE 0.00 0.00 0.00 0.000 METHYLENE CHLORIDE 0.00 0.00 0.00 0.000 TDI 0.00 0.00 0.00 0.000

F'AGE: 108

## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/70 TD 12/31/90 10 -NUMBER OF DATA POINTS (RECEIFT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	50	50	50	0.000	
TOT. SETT. SOLIDS	100.00	100.00	100.00	0.000	
HEATING VALUE	10107	14556	13010	1649.260	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	8.69	8.69	8.69	0.000	
рН	6.00	6.00	6.00	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104 TB 12/31/90 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

	DICHIES	NO DATA	WHO FUCIND	FUR THAT FIELD )	l
DATA FIELD	MIN	MAX	AVG	STD DEV	
	<del></del>			<del></del>	
PER CENT TOT. SOLIDS	24.30	43.24	33.77	9.470	
FER CENT ASH	0.01	0.10	0.06	0.050	
PER CENT WATER	38.89	97 <b>.</b> 73	68.31	29.420	
ORGANIC HALOGEN %	0.00	0.01	0.01	0.010	
ORGANIC NITROGEN %	0.05	2.01	1.03	0.980	
ORGANIC SULFUR %	0.02	0.06	0.04	0.020	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	2.70	6.40	4.55		
BERYLLIUM				1.850	
CADMIUM	0.00	0.00	0.00	0.000	
CHROMIUM	1.00	1.20	1.10	0.100	
LEAD	1.00	2.70	1.85	0.850	
	0.00	8.50	4.25	4.250	
MERCURY	0.00	0.00	0.00	0.000	
SELENIUM	0.00	0.00	0.00	0.000	
SILVER	0.00	0.00			
ALUMINUM	38.10	45.30	41.70	3.600	
ORGANIC CONSTITUENTS %					
MEK	0.00	0.00	0.00	0.000	
1-BUTANOL	0.00	0.00	0.00	0.000	
MIBK	0.00	0.00	0.00	0.000	
TOLUENE	0.00	0.00	0.00	0.000	
BUTYL ACETATE	0.00	0.00	0.00	0.000	
ETHYL BENZENE	0.00	0.00	0.00	0.000	
XYLENE	0.00	0.00	0.00	0.000	
BUTYL CELLOSOLVE	0.00	0.00	0.00	0.000	
CELLO. ACETATE	0.00	0.00	0.00	0.000	
DEG.METHYL ETHER	0.00	0.00	0.00	0.000	
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000	
ISOPHORONE	0.00	0.00	0.00	0.000	
DEG. BUTYL ETHER	0.00	5.70	2.85	2.850	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK	0.00	0.00	0.00	0.000	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR	0.00	0.00	0.00	0.000	
ALKYL BENZENES	0.00	0.00	0.00	0.000	
ISOBUTANOL	0.00	0.00	0.00	0.000	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
FCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000	
TDI	0.00	0.00	0.00	0.000	

FAGE: 112

## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 2
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	210	1850	1030	820.000	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	200	8367	4284	4083.500	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	8.51	9.12	8.82	0.310	
рH	7.00	8.00	7.50	0.500	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14

( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

( ALL ZERUES )	INDICALES	NO DATA	MH2 FOOIND	FUN IMMI FIE	-LD )
DATA FIELD	MIN	MAX	AVG	STD DEV	·
PER CENT TOT. SOLIDS	7.13	96.05	57.02	25.620	
PER CENT ASH	0.14	17.46			
PER CENT WATER	1.13	1.13		0.000	
,,,	2025				
ORGANIC HALOGEN %	0.00	2.72	0.33	0.710	
ORGANIC NITROGEN %	0.00	1.72	0.22		
ORGANIC SULFUR %	0.01	0.10			
2.10.1112	0.01	0.10	0.00	0.000	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00			
BARIUM	0.10	39.00			
BERYLLIUM	0.00	0.20		0.058	
CADMIUM	0.30	1.70		0.377	
CHROMIUM	0.00	7.50			
LEAD	0.00	80.10	9.41	21.060	
MERCURY	0.00	0.00	0.00	0.000	
SELENIUM	0.00	0.00	0.00	0.000	
SILVER	0.00	0.40			
ALUMINUM	11.60	2059.50	242.95	542.940	
ORGANIC CONSTITUENTS :	<u>/.</u>				
MEK	0.00	30.90	3.12	9.260	
1-BUTANOL	0.00	1.00	0.11	0.298	
MIBK	0.00	11.10	1.27	3.310	
TOLUENE	0.00	3.70	0.47	1.117	
BUTYL ACETATE	0.00	4.80	0.61	1.449	
ETHYL BENZENE	0.00	2.60	0.29	0.775	
XYLENE	0.00	12.80	1.44	3.820	
BUTYL CELLOSOLVE	0.00	4.80	0.59	1.440	
CELLO. ACETATE	0.00	0.00	0.00	0.000	
DEG.METHYL ETHER	0.00	0.00	0.00	0.000	
HEXYL CELLOSOLVE	0.00	34.70	3.47		
ISOFHORONE	0.00	0.00	0.00	0.000	
DEG. BUTYL ETHER	0.00	0.10	0.01	0.030	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK	0.00	1.10	0.12	0.328	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	.0.00	0.00	0.00		
ALIPHATIC HYDROCA	R 0.00	0.50	0.05	0.150	
ALKYL BENZENES	0.00	2.40	0.28		
ISOBUTANOL	0.00	0.10	0.01	0.030	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
METHYLENE CHLORID		0.00	0.00		
TDI	0.00	0.00	0.00	0.000	

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111

DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90

NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14

( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	145	145	145	0.000	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	3502	14883	9587	3155.500	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	8.03	8.03	8.03	0.000	
рН	0.00	0.00	0.00	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 11 ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

					<del></del>
DATA FIELD	MIN	MAX	AVG	STD DEV	
PER CENT TOT. SOLIDS	31.36	82,20	57.60	14.720	
			3.10		
			3.61		
		-,	5.51		
ORGANIC HALOGEN %	0.00	0.38	0.06	0.100	
ORGANIC NITROGEN %					
ORGANIC SULFUR %					
			~~~		
HEAVY METALS (ppm)					
	0.00	0.00	0.00	0.000	
			4.38		
			0.00		
			0.72		
		2.30		0.620	
		42.90		12.500	
			0.00		
SELENIUM			0.00		
			1.23		
			16.68		
ORGANIC CONSTITUENTS %	4.00	<u></u>	10.00	0.100	
MEK	0.00	7 50	0.35	1 000	
1-BUTANOL		6.60		2.279	
		9.20		2.820	
		7.40 9.50		2.651	
BUTYL ACETATE					
ETHYL BENZENE					
	0.00		9.38		
BUTYL CELLOSOLVE		26.80		12.770 9.230	
CELLO. ACETATE					
				0.000	
DEG.METHYL ETHER HEXYL CELLOSOLVE					
			0.13		
DEG. BUTYL ETHER			0.00		
			0.16		
NAPHTHALENE			0.00		
MAK	0.00	0.70	0.13	0.226	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR	0.00	28.70	2.87	8.210	
ALKYL BENZENES	0.00	8.60	1.25	2.430	
ISOBUTANOL	0.00	0.10	0.01	0.029	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	1.30	0.12	0.374	
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000	
TDI	0.00	0.00	0.00	0.000	

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 11
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	80	22580	3198	6596.150	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	7261	16314	14427	2455.720	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	7.55	8.81	8.17	0.360	
рΗ	0.00	0.00	0.00	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD STD DEV MIN MAX. AV<u>G</u> PER CENT TOT. SOLIDS 24.34 77.33 41.93 15.480 PER CENT ASH 0.020 0.04 0.07 0.06 PER CENT WATER 4.15 0.34 1.07 1.110 ORGANIC HALOGEN % 0.00 0.08 0.02 0.030 ORGANIC NITROGEN % 0.03 1.73 0.47 0.570 ORGANIC SULFUR % 0.00 0.06 0.030.020 HEAVY METALS (ppm) 0.00 0.000 ARSENIC 0.00 0.00 12.67 BARIUM 0.20 102.90 31.920 BERYLLIUM 0.00 0.00 0.00 0.000 0.000.58 CADMIUM 1.00 0.315CHROMIUM 0.00 13.20 2.36 3.888 LEAD 0.00 0.70 0.10 0.220MERCURY 0.00 0.00 0.00 0.000 SELENIUM 0.00 0.00 0.00 0.000 4.60 0.79 1.388 SILVER 0.00 3.60 ALUMINUM 40.20 18.80 11.920 ORGANIC CONSTITUENTS % MEK 0.00 0.40 0.14 0.140 1-BUTANOL 0.00 4.30 1.23 1.576 MIBK 0.60 17.80 7.66 5.550 TOLUENE 60.10 0.00 8.10 18,410 BUTYL ACETATE 8.97 0.00 46.50 14.620 ETHYL BENZENE 0.004.30 1.19 1.301 XYLENE 0.00 5.69 18.60 5.780 7.19 BUTYL CELLOSOLVE 0.0027.00 8.780 CELLO. ACETATE 0.00 0.00 0.000.000 DEG.METHYL ETHER 0.00 0.00 0.000.000 HEXYL CELLOSOLVE 0.00 0.00 0.00 0.000 ISOPHORONE 0.00 0.00 0.00 $Q \cdot QQQ$ DEG. BUTYL ETHER 0.00 26.70 2.97 8.391 NAPHTHALENE 0.00 0.00 0.00 0.000 MAK 0.000.60 0.07 0.189 ETHYL ACETATE 0.00 0.00 0.000.000 ISOBUTYL ACETATE 0.00 0.00 0.00 0.000 ALIPHATIC HYDROCAR 0.00 20.40 4.66 6.570 ALKYL BENZENES 0.00 4.70 1.16 1.680 ISOBUTANOL 0.00 0.100.02 0.042 0.00 ETHYLENE GLYCOL 0.00 0.00 0.000 PCB'S 0.000.00 0.000.000ETHYL CELLOSOLVE 0.00 18.40 2.04 5.783 METHYLENE CHLORIDE 0.00 0.70 0.08 0.220TDI 0.00 0.00 0.000.000

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102 DATES FOR WHICH THIS DATA WAS COMPILED: TO 12/31/90 01/01/90 NUMBER OF DATA FOINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROFERTIES					
VISCOSITY	25	1870	734	603.830	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	13567	16633	15178	1139.170	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	7.21	9.00	8.07	0.540	
рН	0.00	0.00	0.00	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

\_\_\_\_\_\_ DATA FIELD STD DEV AVG MIN MAX 49.89 PER CENT TOT. SOLIDS 10.86 21.17 13.440 PER CENT ASH 0.09 13.78 3.53 4.890 PER CENT WATER 7.22 90.26 37.68 31.470 19.680 ORGANIC HALOGEN % 2.01 60.42 22.73 0.12 ORGANIC NITROGEN % 0.01 0.37 -0.130ORGANIC SULFUR % 0.02 0.38 0.09 0.130 HEAVY METALS (ppm) 0.00 0.00 0.00 0.000 ARSENIC 77.540 BARIUM 0.60 211.70 38.60 0.000 BERYLLIUM 0.00 0.00 0.00 0.30 0.93 0.502 CADMIUM 1.80 CHROMIUM 41.90 1.00 8.75 14.840 LEAD 0.00 198.20 40.20 71.270 0.00 0.000 MERCURY 0.00 0.00 SELENIUM 0.00 0.00 0.00 0.0000.10 SILVER 0.00 0.020.037 0.00 1058.30 225.60 380.070 ALUMINUM ORGANIC CONSTITUENTS % 0.00 MEK 4.50 1.62 1.650 1-BUTANOL 0.00 0.20 0.06 0.080 MIBK 0.001.35 1.350 3.70 TOLUENE 0.00 1.50 0.46 0.546 BUTYL ACETATE 0.00 0.500.537 1.40 ETHYL BENZENE 0.00 0.90 0.34 0.307 XYLENE 0.00 4.80 1.72 1.640 BUTYL CELLOSOLVE 0.10 0.90 2.30 0.810 0.00 CELLO. ACETATE 0.000.00 0.000 DEG.METHYL ETHER 0.00 0.00 0.00 0.000 HEXYL CELLOSOLVE 0.00 0.00 0.00 0.000 ISOPHORONE 0.00 0.00 0.000 0.00DEG. BUTYL ETHER 0.000.000.000.000NAPHTHALENE 0.00 0.00 0.00 0.000 MAK 0.00 0.500.100.200 ETHYL ACETATE 0.00 0.000.000.000 ISOBUTYL ACETATE 0.00 0.00 0.00 0.000 ALIPHATIC HYDROCAR 0.00 0.46 0.920 2.30 ALKYL BENZENES 0.00 0.48 0.960 2.40 ISOBUTANOL 0.000.10 0.02 0.040 ETHYLENE GLYCOL 0.00 0.00 0.00 0.000 FCB'S 0.00 0.00 0.000.000 ETHYL CELLOSOLVE 0.00 0.000.00 0.000 METHYLENE CHLORIDE 3.60 28.84 48.80 15.810 TDI 0.00 0.000.000.000

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL_PROPERTIES					
VISCOSITY	35	1145	326	473.050	
TOT. SETT. SOLIDS	2.00	50.00	20.67	21.000	
HEATING VALUE	1877	8108	5410	2207.580	
FLASH FOINT	78.00	110.00	86.00	13.860	
WEIGHT/GALLON	8.80	9.91	9.31	0.400	
nН	2.00	2.00	2.00	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 45 ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	<u>MAX</u>	<u>AVG</u>	STD DEV	
PER CENT TOT. SOLIDS					
		0.59		0.190	
PER CENT WATER	0.85	100.00	76.03	33.670	
SECONIC HALBEEN W	0.00	0.04			
ORGANIC HALOGEN %					
ORGANIC NITROGEN %					
ORGANIC SULFUR %	0.00	0.08	0.02	0.020	
HEAVY METALS (ppm)	•				
	0.00	0.00	0.00	0.000	
		28.10		5.630	
	0.00	0.10		0.015	
	0.00	1.40		0.344	
		9.80			
		15.30			
	0.00				
				0.000	
		0.00			•
		11.80			
	0.00	76.70	9.76	12.690	
ORGANIC CONSTITUENTS % MEK	A A.A.	0.5.			
	0.00			1.840	
	0.00			0.058	
		14.00		3.470	
	0.00	26.60		4.863	
BUTYL ACETATE	0.00	1.80		0.411	
	0.00	9.80		2.903	
XYLENE		44.30	6.20		
BUTYL CELLOSOLVE		2.10		0.380	
CELLO. ACETATE	0.00	0.00	0.00	0.000	
DEG.METHYL ETHER		0.00	0.00	0.000	
	0.00	0.00	0.00	0.000	
	0.00		0.00	0.000	
DEG. BUTYL ETHER	0.00	0.10	0.00	0.015	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK	0.00	0.10	0.00	0.015	
ETHYL ACETATE	0.00	0.00	0.00	0,000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIFHATIC HYDROCAR	0.00	10.50	0.59	2.110	
ALKYL BENZENES	0.00	37.50	4.40	9.490	,
ISOBUTANOL	0.00	0.60	0.03	0.125	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.20	0.00	0.009	
METHYLENE CHLORIDE	0.00	0.40	0.03	0.090	
TDI	0.00	0.00	0.00	0.000	
· <del>- •</del>	w a www	127 W 127 327	A. A.A.A.	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	— — — — — — — — — — — — — — — — — — —
PHYSICAL PROPERTIES  VISCOSITY  TOT. SETT. SOLIDS  HEATING VALUE  FLASH FOINT  WEIGHT/GALLON  DH	10 0.01 100 78.00 6.86 2.00	35 4.00 18421 78.00 8.45 9.00	12 1.30 4055 78.00 8.16 3.00	4.200 1.260 6601.770 0.000 0.320 1.710	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 55 ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

THE ZEROES IN	DICHTES		WHO FOUND		
DATA FIELD	MIN	MAX	<u>AV6</u>	STD DEV	
PER CENT TOT. SOLIDS	10.99	66.33	36.34	11.820	
	0.00	0.38			
PER CENT WATER	0.00			6.700	
ORGANIC HALDGEN %	0.01	0.88	0.22	0.200	
	0.00	2.28			
ORGANIC SULFUR %	0.00	0.16			
	<del>_</del>				
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	0.00	23.80	1.86	4.300	
BERYLLIUM	0.00	0.10	0.00		
CADMIUM	0.00	2.10	0.46	0.396	
CHROMIUM	0.00	4.00		0.734	
LEAD	0.00	6.10			
MERCURY	0.00	0.00			
SELENIUM	0.00	0.00			
SILVER	0.00	12.60			
ALUMINUM	0.00	40.40			
ORGANIC CONSTITUENTS %	• • • •		10.17	01,00	
MEK	0.00	3.50	1.43	0.950	
1-BUTANOL	0.00	3.80			
MIBK	2.00	43.70		7.640	
TOLUENE	0.00	5.70			
BUTYL ACETATE	0.10	4.50			
ETHYL BENZENE	0.10	4.20		1.068	
XYLENE	0.60	27,40		7.010	
BUTYL CELLOSOLVE	2.40	23.10	9.59	4.570	
CELLO. ACETATE	0.00	0.00	0.00	0.000	
DEG.METHYL ETHER	0.00	0.00	0.00	0.000	
HEXYL CELLOSOLVE	0.00	2.00	0.35	0.555	
ISOPHORONE	0.00	0.40	0.01	0.066	
DEG. BUTYL ETHER	0.00	6.20	1.31	1.317	
NAPHTHALENE	0.00	0.60	0.04	0.120	
MAK	0.00	4.10	0.86	0.750	
ETHYL ACETATE	$Q \bullet Q Q$	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR	0.00	7.00	1.88	2.140	
ALKYL BENZENES	0.00	10.30	4.62	2.560	
ISOBUTANOL	0.00	1.00	0.27	0.253	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
METHYLENE CHLORIDE	0.00	1.30	0.17	0.320	
TDI	0.00	0.00	0.00	0.000	

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101 DATES FOR WHICH THIS DATA WAS COMPILED: TO 12/31/90 01/01/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	1	2470	218	388.310	
TOT. SETT. SOLIDS	0.01	17.00	6.34	7.580	
HEATING VALUE	10232	23335	14376	1968.230	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	7.30	9.15	8.20	0.380	
pН	0.00	0.00	0.00	0.000	



ANALYSÍS REPORT

PPG - Coatings & Resins . RIDC Park 260 Kappa Drive Pittsburgh, PA 15238

Attention: Dave Mazzocco



#### LANCY ENVIRONMENTAL SERVICES DIVISION OF LANCY INTERNATIONAL, INC.

An Alcoa Separations Technology Company

P.O. Box 419 Pittsburgh, PA 15230-0419 Phone (412) 772-0044 • FAX (412) 772-0055

Report Date\_ 6/15/88 Sample Date by. by\_ Received 6/3/88 FM by\_ Analyzed\_ 6/3 - 6/14/88Staff No. of Samples

Purchase Order #\_ Verbal

Analysis of Soil Samples	Pro	REFERECTORY BRICK		
		ASH	* * **	
	CU88-0155-06	CU-88-0156-06	CU-88-0157-06	
Iab Reference #	<u>8060105</u>	<u>8060106</u>	<u>8060107</u>	
	(mg/L)	(mg/L)	(mg/L)	
TCIP ZHE Leachate				
Acetone	<0.05	<0.05	<0.05	
n-butyl-alcohol	<5.0	<5.0	<5.0	
Carbon disulfide	<1.05	<1.05	<1.05	
Carbon tetrachloride	<0.05	<0.05	<0.05	
Chlorobenzene	<0.15	<0.15	<0.15	
2-methylphenol (o-cresol)	<2.82	<2.82	<2.82	
3-methylphenol (m-cresol)	<2.82	<2.82	<2.82	
4-methylphenol (p-cresol)	<2.82	<2.82	<2.82	
Cresylic acid	<2.82	<2.82	<2.82	
Cyclohexanone	<0.125	<0.125	<0.125	
1,2-dichlorobenzene	<0.65	<0.65	<0.65	
Ethyl acetate	<0.05	<0.05	<0.05	
Ethyl benzene	<0.05	<0.05	<0.05	
Ethyl ether	<0.05	<0.05	<0.05	
Isobutnol	<5.0	< <b>5.</b> 0'	<5.0	
Methanol	<1.0	<1.0	<1.0	
Methylene chloride	<0.20	<0.20	<0.20	
Methylene chloride	<12.7	<12.7	<12.7	
(from pharmaceutical industry)	•			
Methyl ethyl ketone	<0.05	<0.05	<0.05	
Methyl isobutyl ketone	<0.05	<0.05	0.140	
Nitrobenzene	<0.66	<0.66	<0.66	
Pyridine	<1.12	<1.12	<1.12	
Tetrachloroethylene	<0.079	<0.079	<0.079	
Toluene	<1.12	<1.12	<1.12	
1,1,1-trichloroethane	<1.05	<1.05	<1.05	
1,1,2-trichloro-1,2,2-trifluoroethan	ne <1.05	<1.05	<1.05	
Trichloroethylene	<0.062	<0.062	<0.062	
Trichlorofluoromethane	<0.05	<0.05	<0.05	
Xylene	<0.05	<0.05	<0.05	

C. John Ritzert, Manager Technical Operations

## \*NALYSIS REPORT

PrG - Coatings & Resins RIDC Park 2 0 Kappa Drive F\_ttsburgh, PA 15238

A tention: Dave Mazzocco

Analysis of Soil Samples

LANCY ENVIRONMENTAL SERVICES DIVISION OF LANCY INTERNATIONAL, INC. An Alcoa Separations Technology Company

P.O. Box 419 Pittsburgh, PA 15230-0419 Phone (412) 772-0044 • FAX (412) 772-0055

Report Date 6/15/88 (Rev. 8/24/88) Sample Date\_\_\_ 6/2/88 by\_ Received\_ by\_ FM Analyzed\_ 6/3 - 6/14/88by\_ Staff No. of Samples\_ Purchase Order #\_ Verbal

Project #20818

Lab Reference #	CU-88-0155-06 <u>8060105</u> (mg/L)	INCINERATOR ASH CU-88-0156-06 8060106 (mg/L)	REFRACTORY BRICK CU-88-0157-06 <u>8060107</u> (mg/L)
<u>I LP ZHE Leachate</u>			
Chlorobenzene	<0.05	<0.05	<0.05
<pre>2 methylphenol (o-cresol)</pre>	<0.75	<0.75	<0.75
3 methylphenol (m-cresol)	<0.75	<0.75	<0.75
4-methylphenol (p-cresol)	<0.75	<0.75	<0.75
( esylic acid	<0.75	<0.75	<0.75
1 2-dichlorobenzene	<0.125	<0.125	<0.125
Methanol	<1.0	<1.0	<1.0
N'trobenzene	<0.125	<0.125	<0.125
I ridine	<0.33	<0.33	<0.33
Tetrachloroethylene	<0.05	<0.05	<0.05
Toluene	<0.33	<0.33	<0.33
] 1,1-trichloroethane	<0.41	<0.41	<0.41
1,1,2-trichloro-1,2,2-trifluoroethan	e <0.96	<0.96	<0.96

C. John Ritzert, Manager-Technical Operations

## ATTACHMENT G

U.S. EPA Risk Assessment Forum
Dioxin and Furan Toxicity Equivalence Factor Tables

# Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs)

October 1986

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Table 1. Some Approaches to Estimating Relative Toxicities of PCDDs and PCDFs

Basis/ compound	Swiss*	Grant <sup>a</sup> Olie <sup>s</sup> Commoner <sup>d</sup>	New York State*	Ontario <sup>†</sup>	FDA#	CA*	EPA <sup>1</sup> 1981	EPA current recommend
(Basis)	Enzyme		LD±o	Various effects	Various affects			Various effects
Mono thru di CDDs	0	0	0	0	0	0	0	- 0
Tri CDDs	0	0	0	İ	0	0	0	0
2378-TCDD	1	7	1	1	1	,	1	1
other TCDDs	0.01	7	0	0.01	0	0	1	0.01
2378-PeCDDs	0.1	0.1	1	1	0	1	o	0. <b>5</b>
other PeCDDs	0.1	0.1	0	0.01	0	0	0	0.005
2378-HxCDDs	0.1	0.1	0.03	1	0.02	7	o	0.04
other HxCDDs	0.1	0.1	0	0.01	0.02	0	0	0.0004
2378-HpCDDs	0.01	0.1	0	1	0.005	1	0	0.001
other HpCDDs	0.01	0.1	0	0.01	0.005	0	0	0.00001
OCDD	0	• 0	0	0	< 0.00001	1	0	0
2378-TCDFs	0.1	0.1	0.33	0.02	0	1	0	0.1
other TCDFs	0.1	0.1	0	0.0002	0	0	0	0.001
2378-PeCDFs	0.1	0.1	0.33	. 0.02	0	1	0	0.1
other PeCDFs	0.1	0.1	0	0.0002	0.	0	0	0.001

(continued) Table 1.

Basis/ compound	Swiss*	Grant <sup>a</sup> Olie⁵ Commoner <sup>d</sup>	New York State*	Ontario f	FDA#	CA*	EPA <sup>i</sup> 1981	EPA current recommend
(Basis)	Enzyme		ம∞	Various effects	Various effects			Various effects
2378-HxCDFs	0.1	Q. 1	0.01	0.02	0	1	o	0.01
other HxCDFs	0.1	0.1	0	0.0002	0	0	0	0.0001
2378-HpCDFs	0.1	0.1	0	0.02	o	1	o	0.001
other HpCDFs	0	0.1	Ö	0.0002	0	0	0	0.00001
OCDF	0	0	0	0	0	0	0	0

<sup>\*</sup>Swiss Government, 1982. \*Grant, 1977. \*Olie et al., 1983.

<sup>\*</sup>Commoner et al., 1984. \*Eadon et al., 1982. <sup>1</sup>Ontario, 1982.

<sup>\*</sup>U.S. DHHS, 1983. \*Gravitz et al., 1983. \*U.S. EPA, 1981.

# ATTACHMENT H

**Documentation of Partial Closure Activities in 1989** 

REPORT OF CLOSURE ACTIVITIES AND CERTIFICATION OF CLOSURE FOR PPG'S CIRCLEVILLE, OHIO, FACILITY

Submitted to:

PPG Industries, Inc. Circleville, Ohio

O.H. Materials Corp.

Shirley McMaster, P.E. Senior Project Engineer

November 17, 1989 Project 7137

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#### 1.0 INTRODUCTION

PPG Industries, Inc. (PPG) is undergoing closure of four RCRA hazardous waste management units. These units are:

- o Still Pad Drum Storage Area
- o South Pad Storage Area
- o West Drum Storage Area
- o Liquid Waste Incinerator Area

PPG is in the process of ravising the closure plan for submittal to the Chio Environmental Protection Agency (Chio EPA) for final approval.

At PPG's discretion, certain closure activities have taken place prior to the final submittal and subsequent approval of the closure plan. PPG has kept the Ohio EPA advised as to when the closure activities would take place; also, all of Ohio EPA's comments on the closure plan made during the appeal process were taken into account during closure activities. These closure activities have been completed.

#### 2.0 SCOPE OF WORK

OHM was contracted to perform the following tasks:

- o Still Pad Drum Storage Area
  - Wash and rinse the pad
  - Collect and drum the rinsewater
  - Sample and analyze the final rinsate
  - Sample and analyze sediment in two grated cover manholes
  - Provide the professional engineer's Closure Certification
- e South Pad and West Drum Storage Areas
  - Sample and analyze area soils
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification
- o Liquid Waste Incinerator Area
  - Dismantle the incinerator
  - Sample and analyze area soils
  - Sample and analyze the rinsates from flushing the organic waste and aqueous waste feed lines
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification

#### 3.0 METHODS

The following sections describe closure activities and analytical methods.

#### 3.1 STILL PAD DRUM STORAGE AREA

The Still Pad Area was an uncurbed concrete pad approximately 80 feet by 100 feet. There were two grated sewer inlets and two sealed sewer manholes located within the pad area.

OHM operations personnel and the professional engineer mobilized to the site on April 17, 1989. There were no drums on the pad. FFG had previously scarified the top 1/4-inch of the pad. This material was placed into 55-gallon drums and disposed of in Chemical Waste Management of Indiana's TSD facility in Fort Wayne, Indiana (ADAMS CENTER).

OHM installed temporary foam curbing around the pad perimeter and the four sewer inlets. The pad was washed twice with an industrial cleaner and rinsed three times with high pressure water lasers. The rinsewater was collected with wet/dry vacuums and placed in drums. Each of the three rinses were placed in separate drums.

At the completion of the third rinse, the foam was removed and placed in separate drums. In all, 15 drums of liquids and solids were generated:

- o First rinse--three drums
- o Second rinse--four drums
- o Third rinse--three drums
- o Foam dike--four drums
- o Trash, protective clothing--one drum

Samples of the three drums of the third rinse were obtained for analyses. A separate 4 foot long dip tube was used for each drum to ensure sampling of the entire drum contents. Each sample container was filled with equal volumes from each drum.

A sample was also obtained from the plant water used as the rinsewater source. The sample was taken from a tap in the Still House.

OHM also obtained sediment grab samples from the bottom of the two grated cover manholes.

Clean glass containers with Teflon-lined lids were used for all samples. Chain-of-custody forms accompanied all samples.

All 15 drums of rinsate and debris were incinerated on site at the hazardous-waste incinerator.

## 3.2 SOUTH PAD STORAGE AREA

The South Pad is a gravel area, approximately 90 feet by 240 feet. There is a curbed concrete pad, approximately 15 feet by 45 feet located on the south side of the area.

OHM sampling personnel mobilized to the site on July 17, 1989, to perform soil sampling on the South Pad Storage Area, the West Drum Storage Area, and the Liquid Waste Incinerator Area.

Using a grid established by PPG, and the edge of an existing concrete pad as the western boundary of the South Pad, CHM located the sample points. A sample was taken from the center of each box shown as shaded on Figure 3.1.

A power auger was used to remove the top 4 to 6 inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The power auger bit was decontaminated using a soap and water wash and distilled water rinse between each location.

The sample gloves and tongue depressors were discarded after each location. All samples were labeled and transferred to the laboratory in coolers. Chain-of-custody forms accompanied all samples.

The holes were backfilled after the sample had been obtained. The decontamination water was placed in one drum, and trash and debris placed in another drum.

On November 7, 1989, the concrete containment pad was broken up, removed, and transported to ADAMS CENTER.

# 3.3 WEST DRUM STORAGE AREA

The West Drum Storage Area is a gravel area, approximately 10 feet by 100 feet.

Using a grid supplied by PPG and an existing monitoring well as the northwest corner of the area, OHM located the sample points. These points are shown in Figure 3.2.

The samples were obtained in a fashion similar to that described in Section 3.2 for the South Pad Storage Area.

# 3.4 LIQUID WASTE INCINERATOR AREA

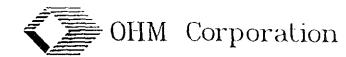
The liquid waste incinerator has been taken out of service.

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		53	54	135/1	56	57	<b>758</b> /	59	60	31/2	62	63	64	65	
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		133/	133	133	134	135/2	136/	133//	138	139	140%	141	142	143	
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		·					EX	ISTING (	CONCRET	TE PAD				•	•

FIGURE 3.1 SOUTH PAD SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES CIRCLEVILLE, OHIO



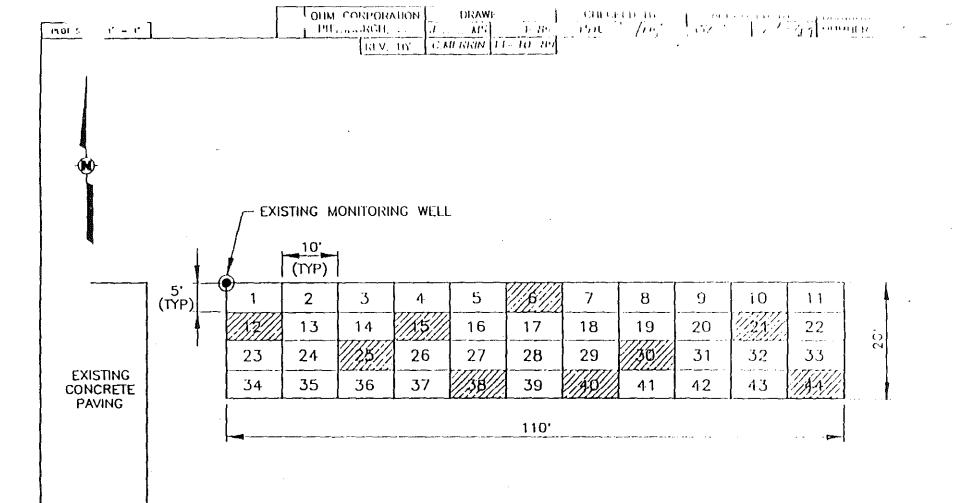


FIGURE 3.2

WEST PAD SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES CIRCLEVILLE, OHIO



On June 5, 6, and 7, 1989, OHM dismantled the incinerator hearth, breech, and stack, and loaded them into trucks for transport to ADAMS CENTER.

## 3.4.1 Soil Sampling

An area surrounding the incinerator pad was selected for soil sampling. The incinerator occupied a concrete pad approximately 10 feet by 40 feet along with a 20 foot square concrete containment area. The area to be sampled was 90 feet by 110 feet.

Using PFG's sampling grid, OHM located the sample points shown on Figure 3.3. The northwest corner of the area was selected 23 feet north and 29 feet west of the corner of the incinerator pad. Three samples were relocated in the field: Location 9 was moved south and east to avoid an existing equipment pad; Location 48 was moved east off the incinerator pad; Location 78 was moved east outside an electrical substation.

All soil sampling activities were similar to those described in Section 3.2, South Pad Storage Area.

# 3.4.2 Line Flushing

There were three pipelines at the Liquid Waste Incinerator that carried hazardous materials. Two of the lines were designated as organic waste feed lines and the other as an aqueous waste feed line. The lines were flushed and drained when the incinerator was taken down. The lines were to be flushed again as part of the closure activities.

OHM's professional engineer was on site on August 24, 1989, to witness the flushing and obtain rinsate samples.

The two organic feed lines were flushed first. A recycle line on the pipe rack was used to recirculate the solvent solution. For each organic line, solvent was circulated at least three times and then sent to PPG's on-site hazardous-waste incineration facility.

Following the solvent flushing, service water was used for the final flushing. Three rinses with clean water were performed. Each rinse was segregated in a separate drum and sent to the on-site incinerator.

The aqueous waste line was flushed three times with deionized water. Each rinse was segregated in a separate drum and incinerated on site.

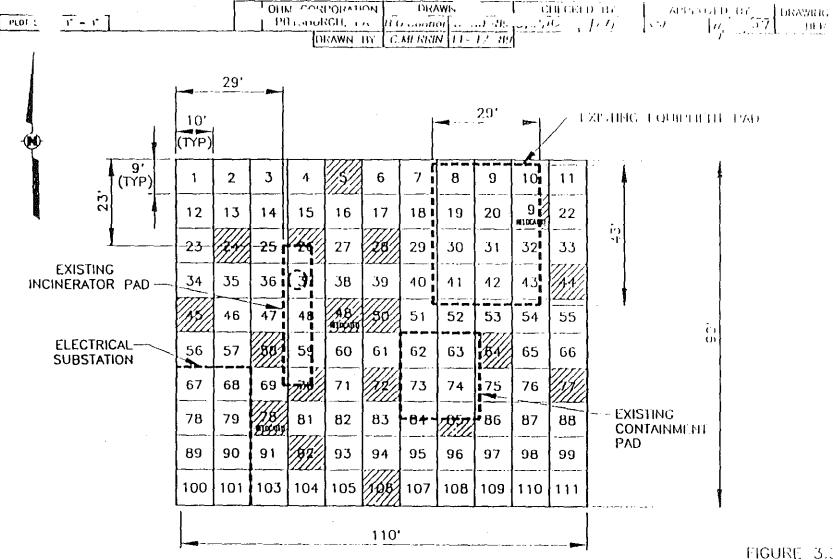
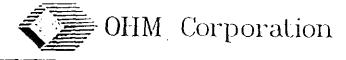


FIGURE 3.3
INCINERATOR AREA
SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES CIRCLEVILLE, OHIO



The three final rinsewaters were sampled. Four-foot long dip tubes were used to ensure a representative sample was obtained from each drum. Samples were also taken from the hose used to supply the service water and a drum of the clean deionized water. The samples were placed in clean glass jars with Teflon-lined lids. Clean dip tubes and sample gloves were used to take each sample. The containers were held in coolers during transport to the laboratory. Chain-of-custody forms accompanied all samples.

# 3.4.3. Concrete Removal

On November 7 and 3, 1989, OHM removed the concrete incinerator pad and containment. The footings for the incinerator pad were removed to a few inches below grade. The concrete was transported to ADAMS CENTER.

# 3.5 ANALYTICAL METHODS

All the samples obtained (soils, rinsates, and source waters) were analyzed for F003 and F005 solvents using the following methods:

- o Alcohols--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 2nd edition, July 1982; Method 5030, Purge and Trap, and Method 8015, Nonhalogenated Volatile Organics.
- o Volatile Priority Pollutants——Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition, September 1986; Method 8240, GC/MS Method for Volatile Organics.

The final rinsate at the Still Pad Storage Area was also analyzed for methylene chloride and acrylonitrile by the above methods and for PCBs by the following method:

O PCBs--The water sample was prepared and analyzed according to USEPA Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, July 1982; Method 608, Pesticides and PCBs.

The soil samples at the South Pad Storage Area, West Drum Storage Area, and the incinerator area were composited and analyzed for PCBs according to the following method:

O USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 2nd edition, July 1982; Method 3550, Sonication or Method 3540, Soxhlet Extraction and Method 8080, Organochlorine Pesticides and PCBs.

The samples at the South Pad were composited into two samples—one encompassing samples S-131, 003 through 14, and 016 through 026; the other samples 027 through 032, and 034 through 051. The 18 nonduplicate samples at the West Drum Storage Area were composited into one sample and the nine non-duplicate samples at the incinerator area were composited into one sample.

The composite soil sample from the incinerator area was analyzed for the following:

Polychlorinated Dibenzo-P-Dioxins and Furans, namely 2,3,7,8-TCDD and 2,3,7,8-TCDF--Sample was prepared and analyzed according to USEPA Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition, November 1986; Method 8280, GC/MS Method for Polychlorinated Dibenzo-P-Dioxins and Furans.

#### 4.0 RESULTS

The following paragraphs discuss the results of the closure activities.

### 4.1 STILL PAD DRUM STORAGE PAD

Of the F003 and F005 solvents analyzed, none were detected in the still pad final rinsate sample. There were no FCBs, acrylonitrile, or toluene disocyanate detected in the final rinsate. Methylene chloride was detected at 169 parts per billion (ppb).

The rinsate was sent to PPG's Circleville incineration facility. The concrete pad was demolished and sent to ADAMS CENTER. The drums of debris from the scarification of the pad were also sent to ADAMS CENTER.

### 4.2 SOUTH PAD STORAGE AREA

The results of the F003 and F005 analyses on the 50 soil samples have been summarized in Table 4.1. Only those 16 sample points which had detectable concentrations are shown in the table. One composite sample had 0.334 ppm PCBs, the other 3.56 ppm PCBs. These soils will be addressed at a future time.

# 4.3 WEST DRUM STORAGE AREA

A total of 10 samples were taken at the West Drum Storage Area. The F003 and F005 solvent concentrations have been summarized in Table 4.2. There were only four locations which had detectable concentrations. There were no PCBs detected in the composite sample. The soils in these areas will be addressed at a future time.

### 4.4 LIQUID WASTE INCINERATOR AREA

There were 19 soil samples taken at the incinerator area. Detectable F003 and F005 concentrations have been summarized in Table 4.3. Only nine locations were above detection limits. There was 1.79 ppm PCBs detected in the composite sample. There was 0.15 ppb of 2,3,7,8-TCDF present in the composite sample while the 2,3,7,8-TCDD was below detectable limits. The soils at these locations will be addressed at a future time.

The rinsate sample analyses for the aqueous waste and organic waste feed lines are summarized in Table 4.4. Detectable concentrations of several F003 and F005 solvents were present in all three final rinsates. The pipe was dismantled; no solids or residue were visible in the pipes. The pipes were sent to ADAMS CENTER for disposal.

TABLE 4.1

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - SOUTH PAD STORAGE AREA

Compounds Detected (ppm)

Sample		7.3	Takal Vulanca	744
Number	Location	Toluene	Total Xylenes	Ethylbenzene
S-131	S-131	2	BDL	SDL
CC4	S-135	BDL	0.11	BDL
605	S-136	0.8	BDL	EDL
010	S-125	0.4	BDL	BDL
013	S-107	0.4	BDL	BDL
015	S-109	BDL	0.6	BDL
018	S-112	0.4	BDL	BDL
021	S-100	21	8	2
024	S <b>-</b> 80	0.5	BDL	BDL
025	S-88	2	BDL	BDL
028	S-76	17	BDL	0.3
029	S-72	BDL	BDL	0.4
031	S-69	1	1.8	0.3
034	S-58	0.3	BDL	BDL
035	S-61	0.3	BDL	BDL
038	S-40	0.4	BDL	BDL
Detection Limit	N/A	0.3	0.3	0.3

BDL = Below Detection Limit

TABLE 4.2

# F003 AND F005 SOLVENTS ANALYTICAL SUMMARY SOILS - WEST PAD STORAGE AREA

# Compounds Detected (ppm)

Sample Number	Location	Methanol	Toluene	Ethylbenzene	=p-Kylene	o-Xylene
053	7-44	0.988	1.34	30L	BDL	BDL
257	¥-06	BDL	BDL	0.229	1.14	1.02
258	¥-38	BDL	0.621	BDL	BDL	BDL
061	¥-12	BDL	BDL	BDL	0.225	0.229
Setectic: Limit	n N/A	.968	.19	. 19	.19	.19

BDL = Below Detection Limit

TABLE 4.3

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - INCINERATOR AREA

Compounds Detected (ppm)

Sample Number	Location	Ethylbenzene	Total Xylenes
066	I - 6 4	0.3	0.9
0.57	I-85	0.6	0.7
070	1-72	BDL	1.7
072	I-70	BDL	BDL
077	I-24	2	4
078	I-28	BDL	BDL
079	I-48	BDL	0.4
080	1-45	0.6	2
081	I-50	BDL	BDL
Detection Limit	N/A	0.3	0.3

BDL = Below Detection Limit

TABLE 4.4

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY

# ANALYTICAL SUMMARY LIQUIDS - INCINERATOR AREA

# Concentration (ppm)

Item	Methanol	Isobutanol	Butanol	Ethyl- benzene	Toluene	Total <u>Xylenes</u>
Organic Waste Line 1	16.5	1.71	10.9	24	33	100
Organic Waste Line 2	93.1	10.1	85.3	36	75	240
Aqueous Waste	BDL	BDL	BDL	9.9	15	31
Service Water	BDL	BDL	BDL	BDL	BDL	ពេកព
Deionized Water	BDL	BDL	BDL	BDL	.17*	BDL
Detection Limit	1.0	1.0	1.0	0.5	0.5	0.5

<sup>\*</sup>Detection Limit - 5 parts per billion

## 5.0 CONCLUSIONS

The closure activities completed to date have been consistent with the specifications set forth in Ohio Administrative Code 3745-66-12 and the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988.

# PARTIAL CLOSURE PLAN

# PPG INDUSTRIES, INC. CIRCLEVILLE OHIO

Prepared For:

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

February 1993

Prepared By:

ICF KAISER ENGINEERS, INC. Four Gateway Center Pittsburgh, Pennsylvania 15222

> ICF KAISER ENGINEERS

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Mr. Robert S. Bear Project Manager ICF Kaiser Engineers, Inc. Four Gateway Center Pittsburgh, Pennsylvania 15222	<u>8</u> -D1

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#### **PREFACE**

This Partial Closure Plan is designed to close four interim status hazardous waste management units in a manner that 1) minimizes the need for further maintenance, and 2) controls, minimizes, or eliminates (to the extent necessary to protect human health and the environment) post-closure escape of hazardous wastes, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface water, or to the atmosphere in accordance with the following applicable federal and state regulations:

Federal:

40 CFR Subpart G, Sections 265.110-115,

265.140-143, 265.147, 265.197 and 265.351

State:

OAC 3745-66-10 through 20

OAC 3745-66-40 through 47

OAC 3745-66-98 OAC 3745-68-51

This revision of the Partial Closure Plan incorporates the responses to all issues identified by Ohio EPA since submittal of the January 14, 1991 Plan. PPG had responded to Ohio EPA's comments in a written, itemized response format with the understanding that once concurrence was reached on all issues identified by Ohio EPA, the January 1991 Partial Closure Plan would be revised to reflect the resolved issues. To facilitate review, new/clarified text has been highlighted in shaded type. Changes made to the January 7, 1993 Plan are presented in shaded, italicized type.

This Partial Closure Plan outlines closure procedures that were performed for the liquid waste incinerator and three drum storage areas at the PPG Circleville resin plant. This plan documents the results of the work completed through the end of 1992. as well as incorporates responses to OEPA comments in 1993 and provides risk assessment criteria to demonstrate the remaining low level residuals do not pose a threat to human health or the environment.

Since this plan is written to describe activities already performed, appropriate documentation such as analytical results for the work performed is attached.

The schedule for past work is presented with actual calendar dates to document when the work was performed. It should be noted that the overall facility closure plan, which included a partial closure plan for the liquid waste incinerator and three drum storage pads, was approved by both Ohio EPA and U.S. EPA in November 1987. All work performed to date has been in accordance with the original approved plan and continuing correspondence with OEPA.

The partial closure of the liquid waste incinerator and drum storage areas began in April of 1989 after notice from the U.S. EPA and Ohio EPA that trial burn results for the Energy Recovery

Unit (ERU) were satisfactory. These areas were permitted as storage and treatment locations under RCRA Interim Status, but will not be retained under Final Permit Status. Figure 6.1 provides a bar chart schedule for partial closure activities performed from April through November, 1989. The Ohio EPA's facility inspector was contacted in advance of crucial closure activities, such as decontamination, soil sampling or removal. The actual dates when the Ohio EPA inspector was on site are documented on the schedule. Section 6.0 of this plan also summarizes key activities that have occurred since November, 1989.

Within 60 days of completing closure activities, PPG will submit the appropriate documentation that closure has been completed in accordance with the approved closure plan (i.e., soil sample analysis results, closure certification statements). The certification by the independent professional engineer and PPG will be in accordance with OAC Rules 3745-50-42 and 3745-50-42(D), respectively.

#### 1. DESCRIPTION OF FACILITY

PPG Industries, Inc., Coatings and Resins Group, owns and operates a manufacturing plant south of Circleville, Ohio in Pickaway County as shown on the site location map (Figure 3.1). The surrounding area is classified as industrial and agricultural. The nearest residential development is approximately one-half mile from the plant boundary. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat.

The facility was originally constructed in 1962. The plant produces resins that are used in the manufacturing of paint and coating products at other PPG divisional manufacturing facilities located throughout the world. During the production of resins and paints, wastes are generated from the cleaning of process equipment, filtering of products, byproducts of reactions, and unusable finished products or raw materials.

The Circleville facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The former locations of the Liquid Waste Incinerator and the West Pad, South Pad, and Still Pad drum storage areas are indicated in Figure 3.2. Wastes from the Circleville facility possess the hazardous characteristics of ignitability, corrosivity, reactivity and/or toxicity characteristic. The incineration process destroyed the ignitable, corrosive, reactive, and organic toxicity properties of the wastes. The incinerator operated for approximately seventeen years (1971-1988) and the drum storage pads were used for periods of five to twenty-four years. The EPA Facility Identification Number for the PPG Circleville Plant is OHD004304689.

In 1987, the Energy Recovery Unit (ERU) began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants throughout North America and processes them for thermal treatment by incineration. The wastes are reduced to a small fraction of their original volume, and the energy value of the waste is recovered in the form of steam to help meet the total energy requirements of the manufacturing plant.

Following the startup and operation of the ERU and the Circleville facility, five hazardous waste storage tanks were kept in service at the resin plant. The former liquid waste incinerator and three drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in this Partial Closure Plan.

The following sections present the Partial Closure Plan for the four interim status hazardous waste management units which were closed in 1989 at the PPG Circleville site. This Partial Closure Plan presents a clean closure of the Still pad and risk assessment demonstration of clean closure of the Former Liquid Waste Incinerator, the West Drum Storage Pad, and the South Drum Storage Pad.

Date: February 18, 1993

# 2. DESCRIPTION OF WASTE MANAGEMENT UNITS CLOSED UNDER PARTIAL CLOSURE

The units closed in 1989 were the Liquid Waste Incinerator, the West Storage Pad, the South Pad and the Still Pad. Closure activities included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

The following descriptions of the closure units are based in part on information contained in the RCRA Interim Status permit.

2.1 Liquid Waste Incinerator -- (refer to Figure 4.1 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a liquid waste incinerator with three (3) lances (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. Other components of the unit included a breech, containing a temperature recorder that controlled the waste feed pumps, and a discharge stack, containing a quench water system. The incinerator had been in use since 1971. Ancillary equipment to the incinerator consisted of three (3) waste lines that fed directly into the lances and a blower that added combustion air and created air turbulence in the incinerator hearth. The incinerator area also included a concrete containment area located southeast of the incinerator pad. The topography of the area is flat. Wastes treated in the incinerator included the following:

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

D001 - Aqueous Decanter Waste (aqueous phase D002 manufacturing process, containing VOCs	
D035	9999999999999999€

F003 - Still sludge including xylene, ethylbenzene and methyl isobutyl ketone

F005 - Still sludge including toluene and methyl ethyl ketone

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

2.2 Waste Drum Storage Area, Still Pad -- (refer to Figure 4.2 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a concrete pad, approximately 80' x 100', on which waste drums were stored. The pad had been in use since 1965. The area is flat. Wastes stored on the pad included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or
	dissolved in one or more of the following solvents: xylene,
	ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl
	ethyl ketone)

F002 - Spent methylene chloride

F003 - Incinerator brick and residue generated by the incineration of F003 wastes

F005 - Incinerator brick and residue generated by the incineration of F005 wastes

U009 - Waste acrylonitrile

U223 - Waste toluene diisocyanate

Drums containing lab packs

2.3 Waste Drum Storage Area, West Pad -- (refer to Figure 4.3 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10'x100'. This unit was in use from 1975-1985. Waste stored in this area included the following:

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

F002 - Spent methylene chloride

2.4 Drum Storage Area, South Pad -- (refer to Figure 4.4 for a detailed drawing of this hazardous waste management unit)

This unit consisted of a flat, packed gravel area approximately 90'x240'. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

## 3. MAPS OF FACILITY

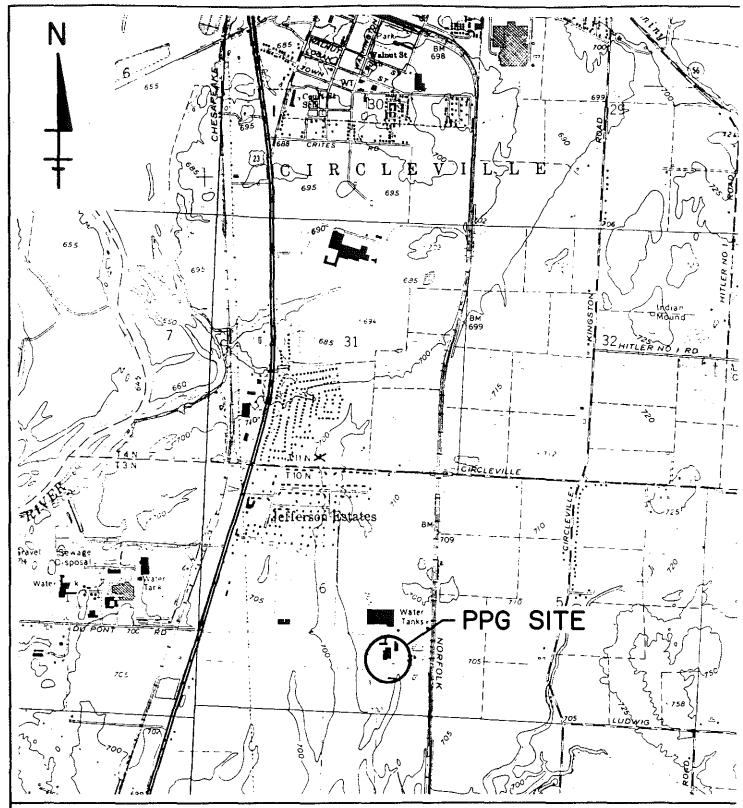
This Section contains two facility maps as required by OEPA Closure Plan Review Guidance. These two figures locate the facility units which were closed within the site property boundaries, located in Pickaway County.

Figure 3.1 is the Facility Location Map and Figure 3.2 depicts the Interim Status Hazardous Waste Management Unit Locations, highlighting the closed units. The scales on these figures are noted.

Figure 3.1 - Facility Location Map

Figure 3.2 - Interim Status Hazardous Waste Management Unit Locations

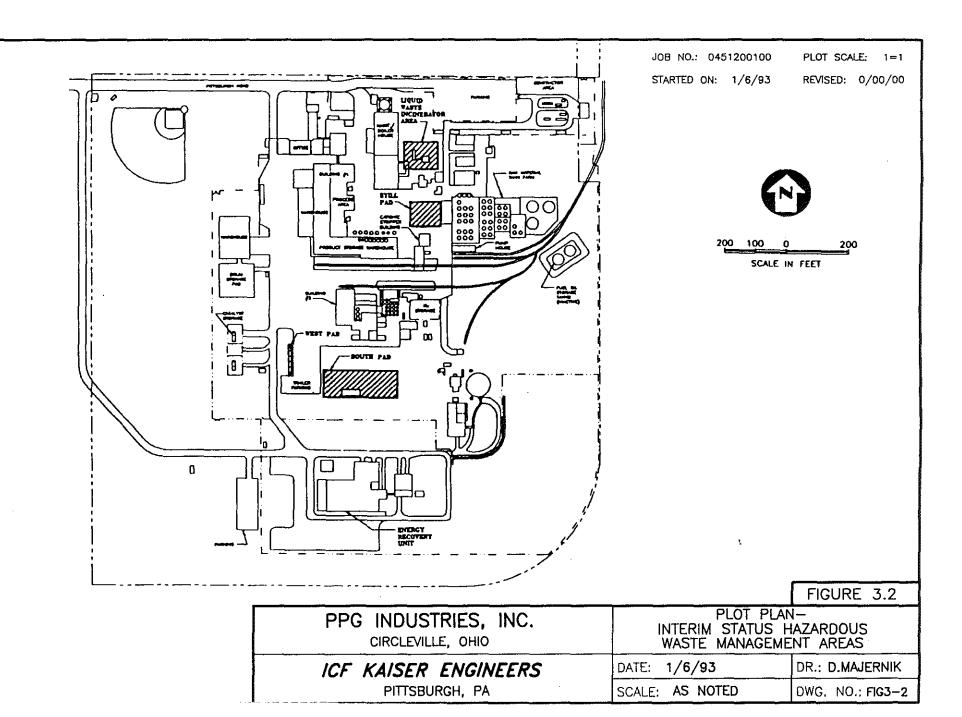
Revision: 2



# REFERENCE

U.S.G.S. 7.5' TOPOGRAPHIC MAP, CIRCLEVILLE, OH QUADRANGLE DATED: 1961, PHOTOREVISED: 1974

		FIGURE 3.1
PPG INDUSTRIES INC. CIRCLEVILLE, OHIO	SITE LOCATION MAP	
ICF KAISER ENGINEERS	DATE: AUG. 21, 1992	DR.: D. BRENT
PITTSBURGH, PA.	SCALE:   = 2000'	DWG. NO.: 04830



# 4. DETAILED DRAWINGS OF UNITS TO BE CLOSED

This Section contains the detailed figures of the closed units as specified by OEPA Closure Plan Review Guidance. The figures are labeled as follows:

Figure 4.1 - Liquid Waste Incinerator

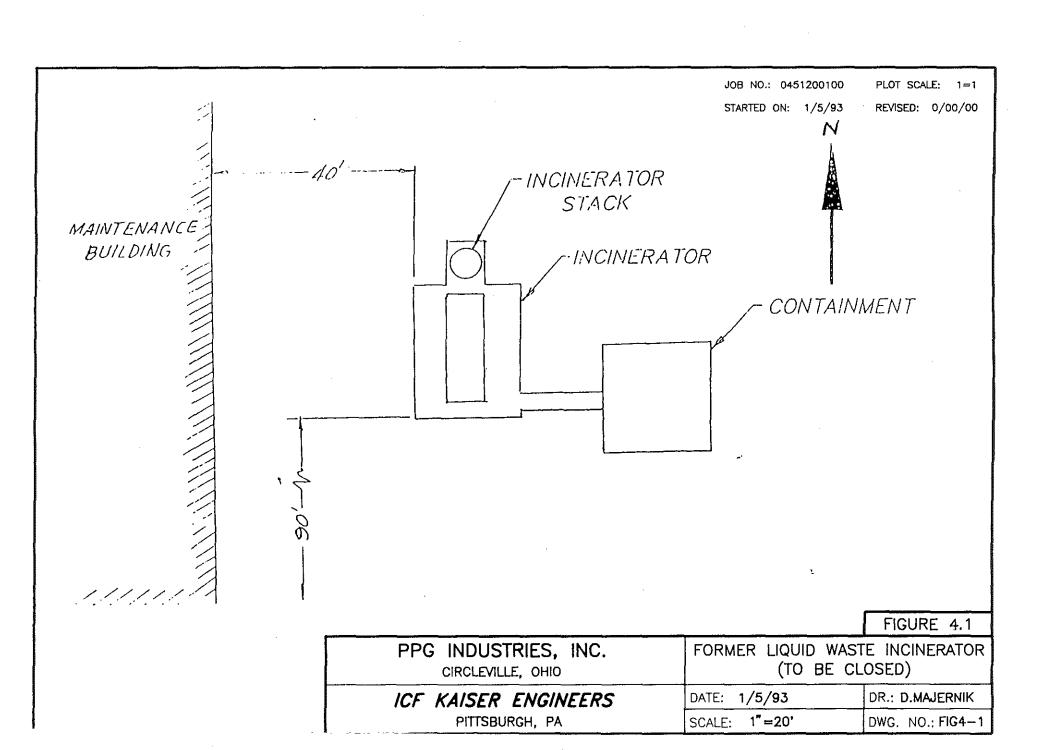
Figure 4.2 - Waste Drum Storage - Still Pad

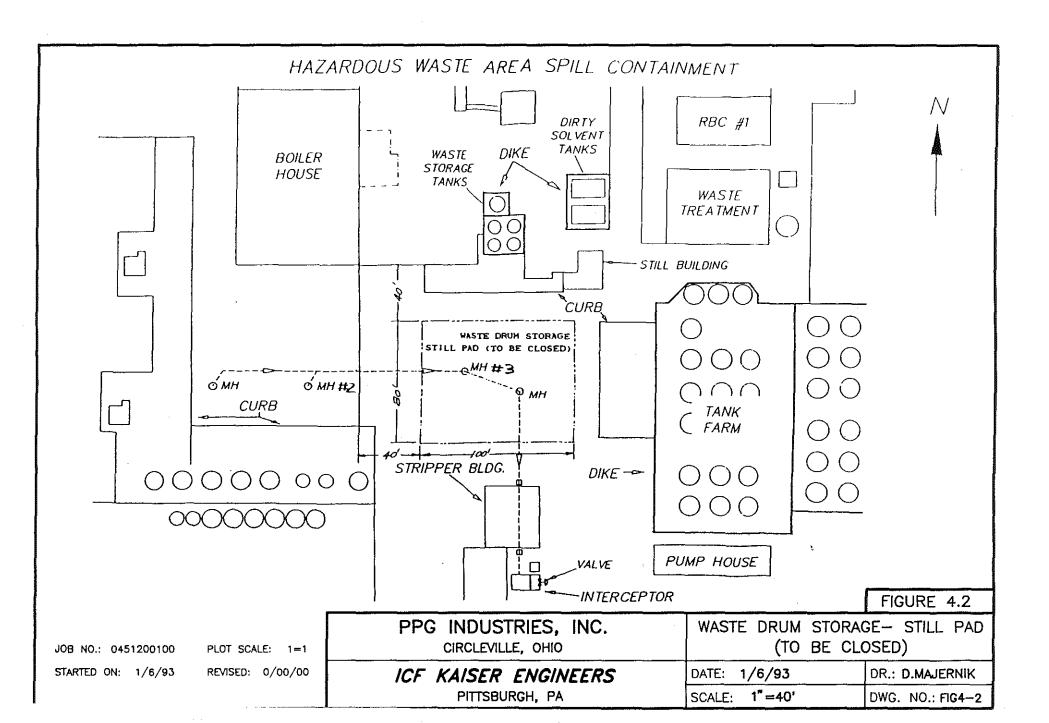
Figure 4.3 - Waste Drum Storage - West Pad

Figure 4.4 - Waste Drum Storage - South Pad

Revision: 2

4-1



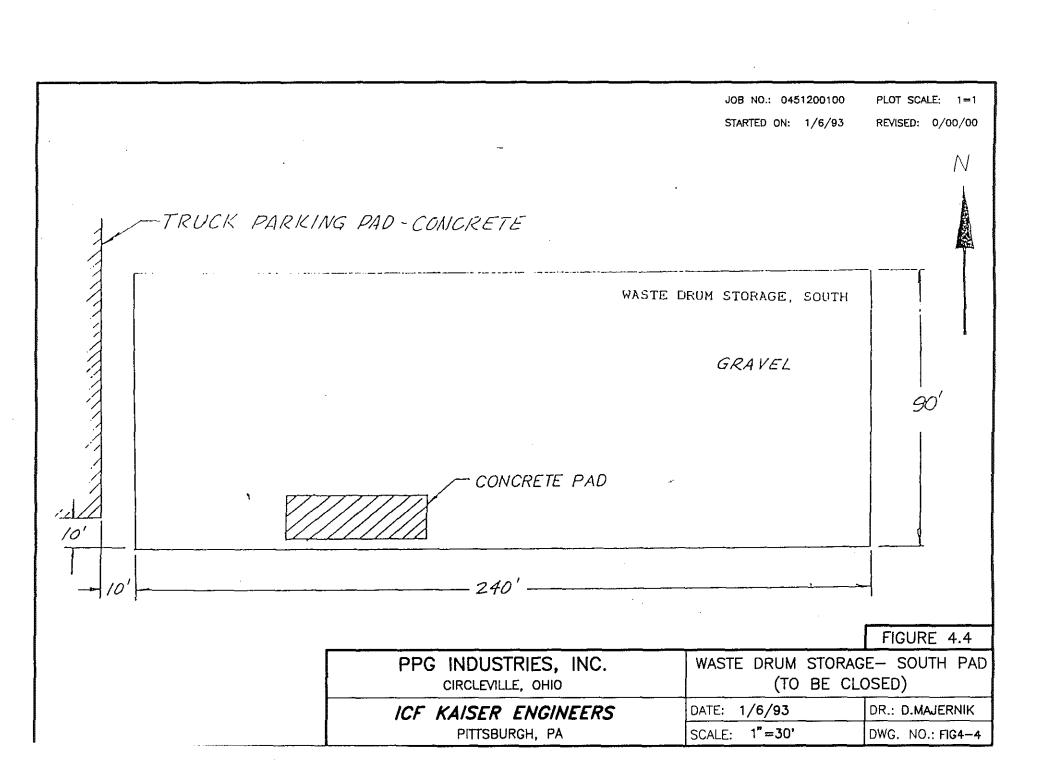


JOB NO.: 0451200100 PLOT SCALE: 1=1 STARTED ON: 1/6/93 REVISED: 0/00/00 WASTE DRUM STORAGE, WEST TRAILER PARKING PAD - CONCRETE FIGURE 4.3 WASTE DRUM STORAGE- WEST PAD PPG INDUSTRIES, INC. (TO BE CLOSED) CIRCLEVILLE, OHIO DATE: 1/6/93 DR.: D.MAJERNIK ICF KAISER ENGINEERS

PITTSBURGH, PA

SCALE: 1"=15'

DWG. NO.: FIG4-3



#### 5. LIST OF HAZARDOUS WASTES

A complete list of hazardous wastes and Appendix VIII hazardous constituents stored and/or treated at the waste management units closed under this Partial Closure Plan follows. This list also includes an estimate of the maximum inventory of waste in storage or treatment.

#### 5.1 Liquid Waste Incinerator

D001 -Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

D001 - Aqueous Decanter Waste (aqueous pha D002 manufacturing process containing VOCs	
D035	

- F003 -Still sludge including xylene, ethylbenzene, and methyl isobutyl ketone
- F005 -Still sludge including toluene and methyl ethyl ketone

Maximum Incinerator Capacity - 5.5 tons/hour

#### Waste Drum Storage Area -- Still Pad 5.2

- D001 -Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
- F002 -Spent methylene chloride
- F003 -Incinerator brick and residue generated by the incineration of F003 wastes
- F005 -Incinerator brick and residue generated by the incineration of F005 wastes
- U009 -Waste acrylonitrile
- U223 -Waste toluene diisocyanate

Drums containing lab packs

Maximum Inventory - 1000 drums

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# 5.3 Waste Drums Storage Area -- West Pad

D001 -

Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

F002 Spent Methylene Chloride

Maximum Inventory - 200 drums

# 5.4 Waste Drum Storage -- South Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

Maximum Inventory - 1500 drums

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol managed at the facility was only associated with the Waste Resin Material (D001).

Revision: 2

#### 6. SCHEDULE FOR CLOSURE

Partial closure of the interim status hazardous waste management units at the site consisted of the following:

- Decontamination of Liquid Waste Incinerator equipment.
- Decontamination of the Still Pad concrete.
- Rinseate sampling and analysis to confirm successful decontamination of the incinerator equipment and Still Pad concrete, and to determine rinseate disposal requirements.
- Disposal of incinerator equipment.
- Removal and disposal of various concrete pads.
- Soil sampling and analysis to confirm that the remaining soils in the areas of the waste management units meet clean closure requirements.

Figure 6.1 shows the schedule in bar chart form, indicating the field activities that were performed during the time period April 1989 through November 1989. Since November of 1989, the following significant activities have occurred as the result of the continuing dialogue between PPG and Ohio EPA:

<u>Date</u>	Activity
05/11/90	PPG submits revised Partial Closure Plan.
07/25/90	Attorney General's office responds to resubmitted Plan. OEPA wants the
	Partial Closure Plan to reflect the work that has already been complete and
	for PPG to decide whether each unit will be clean closed or closed based on
	a risk assessment demonstration of clean closure.
01/14/91	PPG submits revised Partial Closure Plan that includes work completed to
	date and a risk assessment demonstration for clean closure of the South Drum
	Storage Pad, West Drum Storage Pad, and Former Liquid Incinerator area.
05/01/91	OEPA issues new closure guidance document.
06/28/91	OEPA provides comments on January 1991 Partial Closure Plan.
09/13/91	PPG submits response to OEPA issues raised in June 28, 1991 letter.

11/22/91	OEPA responds to 9/13/91 submittal by PPG.
11/26/91	PPG meets with OEPA to discuss each point in OEPA's November 22, 1991 letter.
01/03/92	Letter dated December 31, 1991 from OEPA which summarizes the status of negotiations based on the 11/26/91 meeting is transmitted to PPG. This OEPA letter summarized issues yet to be resolved.
04/14/92	PPG provides written response to OEPA's letter of 12/31/91. PPG's response includes documentation that PCB levels in the sampling results are unrelated to RCRA activities and that no additional sampling is necessary to define the extent of past releases.
05/08/92	Representatives of OEPA visit plant to look at areas covered by the Partial Closure Plan.
06/01/92	OEPA comments in writing on PPG's response of 4/14/92. OEPA accepts PPG's documentation that PCBs found as a result of closure sampling activities are unrelated to RCRA activities. OEPA requires that the full extent of contamination must be defined.
07/27/92	PPG responds in writing to OEPA's letter of 6/1/92. PPG proposes to perform additional soil sampling to move negotiations forward.
08/04/92	OEPA conducts site visit of plant.
08/07/92	PPG responds in writing to OEPA's site visit and proposes to take an additional sample from the former liquid incinerator area.
08/31/92	OEPA accepts the additional sampling proposed in PPG's letters of 7/27/92 and 8/7/92.
09/23/92	ICF Kaiser Engineers conducts additional sampling.
10/07/92	

Hearing date is set for February 8, 1993.

10/31/92 ICF Kaiser Engineers re-samples grids where samples from 9/23/92 exceeded their holding time for analysis. PPG submits results of additional sampling program to OEPA. 12/11/92 01/08/93 PPG submits revised Partial Closure Plan to reflect all resolved issues. 01/19/93 OEPA Central Office comments on the revised Partial Closure Plan dated January 7, 1993. 01/21/93 OEPA Central District Office comments on the revised Partial Closure Plan dated January 7, 1993. 01/29/93 PPG responds in writing to OEPA's comments of 1/19/93 and 1/21/93. 02/02/93 Hearing Examiner, counsel for PPG, and counsel for OEPA staff participate in a telephone conference call in which counsel represented that the parties had reached a settlement agreement. Additional time was requested to prepare a settlement agreement. 02/05/93 Attorney General's office responds to PPG response of 1/29/93. OEPA accepts PPG responses and requires that the Partial Closure Plan address all necessary sampling to define the vertical extent of contamiantion or provide for amending the Closure Plan to address closure in place. 02/08/93 Hearing Examiner orders filing of Settlement Agreement on or before March I, 1993.

The only remaining schedule item is final certification by an independent registered Professional Engineer and PPG which will perform after acceptance of this revised plan by the Agency.

dated 2/5/93 from the Attorney General's office.

PPG submits revised Partial Closure Plan to incorporate comments in the letter

02/19/93

JOB NO.: 0451200100

PLOT SCALE: 1=1

STARTED ON: 1/5/93

REVISED: 0/00/00

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	/9 9,	/16 9,	/23 9,	/30 10	/7 10/1	4 10/21	10/28 11	/4 11/	11
CONTRACTOR MOBILIZATION									
INCINERATOR AREA									
INCINERATOR DEMOLITION AND DISPO OEPA WITNESSES INCINERATOR DEMO LINE FLUSHING RINSEATE SAMPLING AND ANALYSIS REMOVE AND DISPOSE OF INCINERA- REMOVE AND DISPOSE OF CONTAINA REMOVE AND DISPOSE OF PIPING OEPA NOTIFIED OF SOIL SAMPLING INCINERATOR AREA SOIL SAMPLING									
STILL PAD AREA									
CLEAN STILL PAD STILL PAD RINSEATE SAMPLING AND MANHOLE SEDIMENT SAMPLING AND OEPA WITNESSES STILL PAD WORK REMOVE AND DISPOSE OF STILL PAI									
SOUTH STORAGE PAD AREA									
REMOVE CONCRETE CONSOLIDATION OEPA NOTIFIED OF SOIL SAMPLING SOIL SAMPLING AND ANALYSIS					**************************************				
WEST PAD AREA									
OEPA NOTIFIED OF SOIL SAMPLING SOIL SAMPLING AND ANALYSIS									
<u> </u>									

4		FIGURE 6.1								
	PROJECT SCHEDULE									
	1989 PARTIAL CLOSURE ACTIVITIES									
	DATE: 1/5/93	DR.: D.MAJERNIK								
	SCALE: NONE	DWG. NO. TIMELINE.OWG								

JOB NO.: 0451200100

PLOT SCALE: 1=1

STARTED ON: 1/5/93

REVISED: 0/00/00

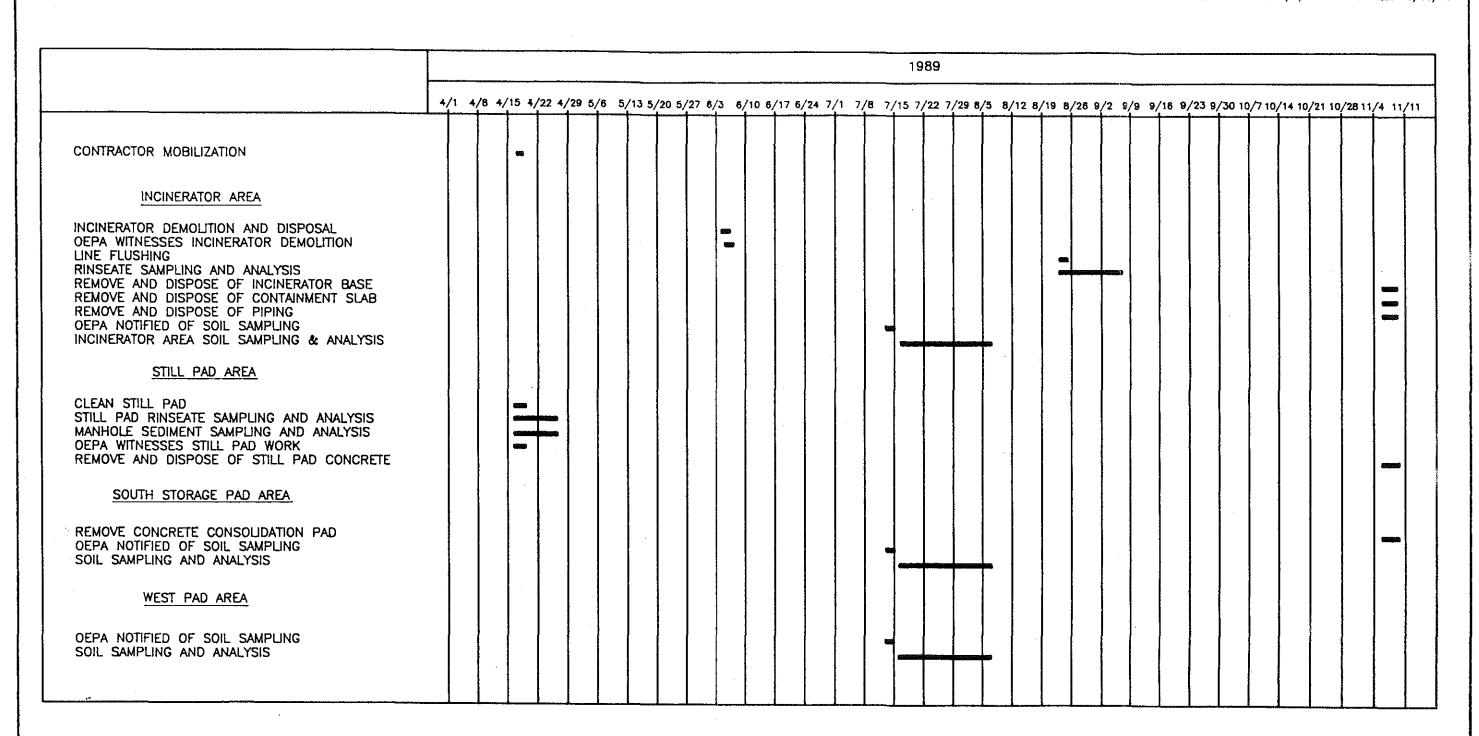


		FIGURE 6,1						
PPG INDUSTRIES, INC.	PROJECT SCHEDULE							
CIRCLEVILLE, OHIO	1989 PARTIAL CLO	SURE ACTIVITIES						
ICF KAISER ENGINEERS	DATE: 1/5/93	DR.: D.MAJERNIK						
PITTSBURGH, PA	SCALE: NONE	DWG. NO. TIMELINE DWG						

# 7. AIR EMISSIONS

Appropriate engineering controls were used during the partial closure activities to minimize odors and dust emissions. Water spray was used as necessary to control fugitive dust emissions during incinerator decommissioning. Overspray from high pressure washing of the Still Pad was controlled by carefully directing the spray towards the center of the containment area and by plastic wrapped plywood barriers when working near the pad edges.

Partial Closure Plan 04512-01-B

Revision: 2 Date: February 18, 1993

#### 8. PERSONNEL SAFETY AND FIRE PREVENTION

Partial Closure Work was performed in Level D protection. The personnel protective equipment consisted of coveralls, gloves, steel-toed boots, eye protection and hard hats. This level of protection provided adequate dermal and respiratory protection from the substances present in the closure areas and the work activities performed. Dust respirators (Level C respiratory protection) were used whenever personnel entered the incinerator or whenever conditions required them.

PPG plant safety rules were followed by clean-up and sampling personnel at all times during closure activities. These rules are attached as Attachment D. These safety rules address possible hazards to workers present at the plant, and describe specific fire prevention measures. Areas undergoing closure were isolated with yellow caution tape to limit access.

To prevent the spread of contamination during the 1989 closure activities, the following procedures were followed:

Prior to leaving the decontamination area, the coveralls were removed and discarded; residues from the boots or other outer protective clothing were scraped or rinsed. Personnel undergoing decontamination stood in containment areas to catch all rinseate and residues resulting from decontamination activities.

Partial Closure Plan 04512-01-B

Revision: 2 Date: February 18, 1993

#### 9. DECONTAMINATION EFFORTS

An independent registered Professional Engineer has certified that appropriate methods were used and that a minimum amount of residue remains based on the activities performed in 1989. The risk assessment as described in Section 10 of this Closure Plan confirms that the remaining residues do not present an unacceptable risk to human health. The results of analytical tests on the rinseates generated during decontamination efforts are included in Attachments A and B. Attachment A includes the results of all analyses performed during the closure under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds. Additional soil sampling performed in 1992 at three of the interim status hazardous waste management units is described in Section 11.0 and the results included in Attachment C.

#### 9.1 Incinerator

After shutdown and cooldown, all residue in the incinerator hearth, breech and stack were removed and put into drums. It was evident that decontamination was not feasible, due to difficulty in removing refractory material from metal parts. The incinerator hearth, breeching, stack, refractory, and ancillary equipment were dismantled and loaded into roll-off boxes or dump trailers and transported to Adams Center Landfill, a RCRA permitted secure landfill, located in Fort Wayne, Indiana. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of this analysis are also included in Attachment B.

# 9.2 Incinerator Organic Waste Feed Lines

There were two (2) organic waste feed lines, each of which was approximately 120 feet long and 1-1/2 inches in diameter.

These lines were cleaned of organic residue by repeatedly flushing them with fifty gallons of cleaning solvent (the same solvent used by PPG to clean production equipment). The cleaning solvent was analyzed for percent total solids before and after each flush. When the "before" and "after" percent solids analysis of the cleaning solvent were within 0.5 percent of each other, solvent cleaning ceased. The spent solvent was sent to the on-site permitted hazardous waste incineration facility (ERU).

Following the solvent cleaning the lines were flushed three times with water to remove residual solvent. This water also was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the pipe as a hazardous waste rather than attempt further decontamination.

Revision: 2

9-1

The cleaned pipe was then taken down, cut into sections, and visually inspected for hardened residues. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

# 9.3 Incinerator Aqueous Waste Feed Line

The aqueous waste feed line was about 100 feet long and one (1) inch in diameter.

The aqueous waste feed line was flushed three times with deionized water. The flushing water was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the feed line as a hazardous waste rather than attempt further decontamination.

Once cleaned, the line was taken down, cut into sections, and inspected. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

# 9.4 Incinerator Base, Spill Containment Pad and Drum Storage Pad (Still Pad)

After the incinerator equipment and residues were placed in secure containers as previously described, the incinerator base, spill containment pad and adjacent drum storage area were swept to remove any loose debris.

These areas then were scraped to remove any visible residues. All residues removed from the concrete surface were placed into DOT-approved 17-H drums.

No further cleaning was performed on the incinerator base and containment pad. These were removed and disposed of as a hazardous waste in the Adams Center Landfill. Although this material may have been considered "non-hazardous" under 40 CFR Part 26%, it was disposed of as a hazardous waste.

The Still Pad was decontaminated with high pressure water. Rinseate was contained inside a foam dike which was installed at the perimeter. The dike material was used to provide a leak-proof containment area. During cleaning operations, all rinseate was collected using drum vacuums. The recovered water was transferred to DOT-approved 17-E drums. The final rinse was collected, placed into drums, and a composite sample collected using glass coliwassa tubes. The rinseate was analyzed for the entire Hazardous Substance List including the following F002, F003, and F005 substances:

Xylene Ethylbenzene Methyl Isobutyl Ketone Methanol
Toluene
Methyl Ethyl Ketone
Methylene Chloride

The rinseate samples from this area were also analyzed for PCBs (polychlorinated biphenyls) and acrylonitrile. Toluene diisocyanate, also stored here, was not included in this analysis. This substance is reactive with water and cannot be quantified by standard analytical methods.

Of the above substances, only methylene chloride was found above detectable limits (169 parts per billion) in the final rinseate. Since no MCL or MCLG exists for methylene chloride, 1 mg/L is the clean standard for the rinseate. A library search for tentatively identified compounds also detected 84.1 mg/L of Butyl Cellosolve. This contaminant was most likely a result of using reconditioned 17-E Drums for rinseate collection. However, this compound is not a hazardous constituent as defined in 40 CFR Part 261. On this basis, the Still Pad was considered clean. All rinseate and foam dike material was incinerated on-site at the ERU.

As described in Section 12, the Still Pad was removed as part of PPG's East Yard PCB Remediation and Spill Containment Project. All concrete within the Still Pad area was removed and disposed of as a hazardous waste at the Adams Center Landfill. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of these analyses are included in Attachment B. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

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# 10. CLEAN LEVELS FOR SOILS

# 10.1 Introduction

In order to demonstrate the clean closure of the Former Liquid Waste Incinerator, West Drum Storage Pad and the South Drum Storage Pad, a risk assessment was performed to determine whether or not a threat to human health exists in association with the residual chemicals originating in these three units. The risk assessment was conducted in accordance with the approaches and design required by OEPA's "Closure Plan Guidance Manual" (1991; with errata sheets), despite the fact that these approaches do not reflect anticipated site situations. This section is a brief summary of the supporting risk assessment for this partial closure. Details of the information presented here may be found in the risk assessment document included as Attachment E.

# 10.2 Background

The risk assessment was conducted in a manner consistent with the original National Academy of Sciences approach (1983), which recommends the four steps as follows: hazard identification (identification of chemicals of concern), which includes organization of unit investigation data and identification of chemicals of concern; dose-response assessment (toxicity assessment), which involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern; exposure assessment, which consists of identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and risk characterization, which is a description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action. Each step is addressed in greater detail below.

#### 10.3 Chemical Selection

OEPA requires that every chemical attributable to and detected in each unit be incorporated into the risk assessment. In addition, the highest concentration of each detected chemical must also be included in the risk assessment for each unit. The applicable detected chemicals for each unit are presented in Table 10.1. These chemicals and the maximum concentrations were incorporated into the subsequent steps of the risk assessment.

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# 10.4 PCB Exclusion

Polychlorinated biphenyls (PCBs) were detected in some of the soil samples collected from beneath the South Pad and Former Liquid Waste Incinerator areas; however, the presence of PCBs in these areas is not related to RCRA waste management activities and thus, PCBs were not included in the list of compounds addressed by the risk assessment. Attachment F presents PPG's documentation and certification that PCB levels recorded were not related to RCRA activities. This documentation was previously submitted to OEPA on April 14, 1992 and accepted by OEPA in their letter dated June 1, 1992.

Extensive PCB remediation has been conducted at the site by PPG. This remediation began in April of 1988 as a result of finding PCB contamination in the plant storm sewers. The source of this contamination was the hot oil Therminol System. Remediation followed the guidelines of the PCB Spill Cleanup Policy and applicable TSCA (Toxic Substances Control Act) requirements. The "action" level for soils tested as part of this remediation is 25 ppm as set forth in the cleanup policy for restricted area locations.

The storm sewer, including manholes in the Still Pad area, were included in the Phase III East Yard remediation project. Compounds present in the two open manholes in the Still Pad Area were clearly from sources other than the waste stored on the Still Pad Area. During remediation of the East Yard Area, PCB and VOC analysis were completed upstream, e.g., Manhole #2, of the Still Pad and showed elevated levels of PCBs and VOCs. Considering the source of PCB's (Therminol pump area) and VOC's (bulk product loading) it is clear these compounds were not related to hazardous waste storage at the Still Pad. These manholes were completely removed and replaced along with the rest of the contaminated storm sewers. All surface concrete in the East Yard area was also removed and replaced. A final report detailing remediation activities and sampling was submitted to OEPA in February 1990 and titled "East Yard Remediation, PPG Industries, February 1990, Project Number 88727". This contamination was and is being addressed by the Administrative Order of Consent signed between PPG and OEPA dated December 1989.

# 10.5 Dose-Response Assessment

To identify dose standards (benchmark values) for each of these chemicals, the USEPA Health Effects Summary Tables (HEAST) and Integrated Risk Information System (IRIS) were accessed and the information was incorporated into the risk assessment. Table 10.2 presents the benchmark values for each chemical of concern.

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# 10.6 Exposure Assessment

OEPA requires a future unrestricted land use scenario for RCRA closure risk assessments. This scenario was incorporated into this risk assessment, for both an adult and a child, using factors as required in the OEPA "Closure Plan Guidance Manual". The exposure pathways required by OEPA were evaluated quantitatively, as follows: ingestion of chemicals in soil, dermal contact with chemicals in soil, inhalation of chemicals associated with unit-originated airborne particulate matter, ingestion of chemicals in water, inhalation of chemicals volatilizing during showering dermal contact with chemicals in water, and inhalation of chemical volatilizing from soil. Where specific approaches were not identified by OEPA, appropriate calculations were incorporated, complete with explanations of factors, equations and full literature citations.

To document that there is no potential for constituent migration to groundwater, a total of four soil samples will be collected at a depth of 6"-12" below ground surface at Grid Location Numbers 24 and 45 at the Former Liquid Waste Incinerator and Grid Location Numbers 71 and 100 at the South Drum Storage Area and subjected to the TCLP leaching procedure. TCLP leachates produced will be analyzed for volatile organic constituents of concern (ethylbenzene, toluene, xylene and methylene chloride) using EPA SW 846 Method 8240.

#### 10.7 Risk Characterization

The results of the risk assessment are presented in the risk characterization section of Attachment E. Noncancer hazard indices, summed for all chemicals and all exposure pathways, and theoretical excess lifetime cancer risks, summed for all chemicals and all pathways in each unit are presented here. OEPA requires that summed non-cancer hazard values be less than one, and that summed theoretical excess lifetime cancer risks be less than one in one million, or 1 x 10<sup>-6</sup>. The data indicate that these values are within the acceptable limits for each unit. These data are presented in Table 10-3.

# 10.8 Uncertainty Analysis

The uncertainty analysis section of Attachment E qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the USEPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in an actual situation. Thus, the risks documented in this report are far in excess of those which would be anticipated to actually occur. Details on the basis for these conclusions are presented in the risk assessment document.

# 10.9 Conclusion

The results for the three units, the Former Incinerator, the South Pad and the West Pad, incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are within the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991). No subsequent evaluation or post-closure monitoring is recommended.

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# **TABLE 10-1**

# CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	Xylene Ethylbenzene Methylene Chloride
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

TABLE 10-2
BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)-1	(mg/kg-day) <sup>-1</sup>
Xylene	2.0 E+0	2.0 E+0 <sup>1</sup>	NA <sup>2</sup>	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA NA
Methylene Chloride	6.0 E-2	8.6 E-1	7.5 E-3	1.7 E-3

<sup>&</sup>lt;sup>1</sup> In absence of inhalation reference dose, the oral reference dose was used.

References: U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

<sup>&</sup>lt;sup>2</sup> NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

SUMMARY TABLE FOR COMBINED HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS

**TABLE 10-3** 

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	6.26 E-03	8.83 E-07
Child/Incinerator Area	1.32 E-02	3.69 E-07
Adult/South Pad	1.43 E-02	6.62 E-07
Child/South Pad	3.22 E-02	2.77 E-07
Adult/West Pad	8.52 E-04	NA
Child/West Pad	1.91 E-03	NA

NA - No putative carcinogenic chemicals detected in this area

# 11. SOIL SAMPLING AND ANALYSIS

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Sampling was performed by independent contractors, and the analysis was performed by an outside laboratory with an approved QA/QC plan for each parameter of interest. A copy of the laboratory's QA/QC qualifications was submitted to PPG. Actual QA/QC analysis is included in the analytical reports or available from the laboratory.

A summary of all 1989 soil sampling analytical results is included in Attachments A and B. Attachment A includes the results of all analyses performed during the Partial Closure activities under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds.

In September 1992, PPG conducted additional sampling at the South Pad, West Pad and Former Liquid Waste Incinerator as agreed to in PPG's letters to OEPA dated July 27, 1992 and August 7, 1992. Results of this additional sampling effort are summarized in the Closure Plan Addendum presented in Attachment C. This addendum was submitted separately to OEPA on December 11, 1992.

The following Sections 11.1 through 11.4 summarize the soil sampling activities and results from the Partial Closure Activities performed in 1989. Attachment C describes the 1992 additional soil sampling program.

The results of these sampling efforts have established that no constituents of concern occur at unacceptable risk levels. However, detectable concentrations of methylene chloride were identified in 12"-24" samples from two locations at the Former Liquid Waste Incinerator (Grids 24 and 45) and one location at the South Drum Storage Area (Grid 100). To further define the occurrence of methylene chloride at depths below the 24" level from the units being closed, PPG will collect a minimum of two samples from these locations at 1 foot intervals below the 24 inch depth. The samples collected will be analyzed, along with appropriate QA/QC samples, for methylene chloride using EPA SW-846 method 8240. Additional sampling will be conducted if methylene chloride is detected in soil samples and the laboratory can document that the detection is not a result of laboratory contamination.

# 11.1 Incinerator Area

The soil around the Former Liquid Waste Incinerator was tested in 1989 for constituents listed below at points designated by the hatched areas of the Sampling Grid as shown in Figure 11.1. The representative sample points noted on all Sampling Grids in this Plan (Figures 11.1, 11.2 and 11.3) were

developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. Samples were collected according to EPA soil sampling and chain-of-custody protocol and analyzed using EPA SW-846 methods. A power auger was used to remove the top four to six inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

One composite soil sample made up of all eighteen soil samples from the area was analyzed for all dioxins and furans according to SW-846 Method 8280, including 2,3,7,8- TCDD (polychlorinated dibenzo dioxin), 2,3,7,8-TCDF (polychlorinated dibenzo furan), and PCBs (Polychlorinated Biphenyls) according to SW-846 Method 8080. Ignitability was not checked because there is no approved method of testing flashpoint of solids. The samples were not analyzed for heavy metals because metals were not used in manufacturing processes at the facility where the waste was generated.

It is unlikely that spills occurred in the incinerator area because of the closed piping system. The most likely source of leakage, if it occurred, would have been at the connection to the incinerator. No contaminated runoff occurred to the best of PPG's knowledge because of the containment pad around the incinerator. Samples were taken in the areas designated in Figure 11.1.

The results of the sampling are summarized in Attachments A, B and C. Although no constituents have been detected at unacceptable risk levels, additional samples will be collected from Grid Locations 24 and 45 to further define the extent of vertical contamination so that the Incinerator Area can be considered clean closed.

#### 11.2 Still Pad

Sediment grab samples were obtained in 1989 from the bottom of the two grated cover manholes in this area. The sediment samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition; methanol, butanol, isobutanol, and butyl cellosolve were quantified according to SW-846 Methods 5030 and 8015. These samples also were analyzed for PCBs according to SW-846 Method 8080.

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of

Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East Yard were removed and replaced. A summary of analytical results from post remediation sampling is included in Table 11.1. To clarify the data presented in Table 11.1, Manhole #3 was within the area of the Still Pad and Manhole #2 was upgradient in the storm sewer system and closer to the source of VOC contamination (bulk product loading). A sketch of this portion of the East Yard showing the Still Pad and the location of the manholes and storm sewers is included in Figure 4.2. The Still Pad is considered cleaned closed and no further action is necessary.

# 11.3 South Drum Storage Area

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.2, using methods previously described under Section 11.1. Analyses for HSL volatiles organics and alcohols were performed as described in Section 11.1.

Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B, and C. Although no constituents have been detected at unacceptable risk levels, additional samples will be collected from Grid Location 100 to further define the extent of vertical contamination so that the South Drum Storage Area can be considered clean closed.

# 11.4 West Drum Storage Pad

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.3, using the methods previously described under Section 11.1. Analyses for HSL volatile organics and alcohols were performed as described in Section 11.1.

One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B and C. Since no constituents were detected at unacceptable risk levels, the West Pad is considered clean closed, and no further action is required.

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# TABLE 11.1

# EAST YARD POT-REMEDIATION SAMPLING RESULTS VOC AND PCB ANALYSIS All Results in µg/kg

	Manhole #2 Area	Manhole #3 Area						
Volatiles	CV-89-0691	CV-89-0688	CV-89-0689					
2-Butanone	920 1	490 ]	800 J					
Toluene	2100	580 U	800 U					
Ethylbenzene	51000	2500	7000					
Xylene	330000	24000	21000					
4-methyl-2-pentanone	3700 U	1200 U	1600 U					
PCB (A-1248)	2,100,000/1,500,000	590 U	3500					

Letters refer to standard CLP qualifiers.

Note: Manhole #2 is located upgradient of the Still Pad. Manhole #3 was within the area of the Still Pad.

						<u></u>						0451200100 N: 1/5/93	PLOT SCALE: 1=1  REVISED: 0/00/00
	<b>├</b> ∞-	10'								3	TARTED O		KEVISED. 0/00/00
	9'	1	2	3 4		6	7	8		10	11		A
	1	2 1	3   1	4   15	5   16	17	18	19	20	21	22		7
INCINERATOR STACK	2	3 /2	4) 2	5 23	27	17///	29	30	31	32	33		
	3	34 3	5 3	6 3	38	39	40	41	42	43	441		Parameter 2
INCINERATOR -	4	5 4	6 4	7 4	49	50	51	52	53	54	55	90'	
INCINERATOR	5	6 5	7 5	8 5	60	61	62	63	64/	65	66		•
	6	7 6	8 6	9 //	71		73	74	75	76	///// //77/	C(	ONTAINMENT
	1	7	9 8	0 81	82	83	84	85	86	<i>87</i>	88		211 17 III TIVILIT I
	8	9 9	0 9	1 92	93	94	95	96	97	98	99		
	10	00 10	01 10	2 103	3 104	105	////// /1063	107	108	109	110		
						- 110'						_ <del>,</del>	FIGURE 11.1
				PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO						FORM			GRID FOR TE INCINERATOR
				ICF KAISER ENGINEERS PITTSBURGH, PA							DATE: 1/5/93 DR.: D.MAJER  SCALE: 1"=20' DWG. NO.:FIG		

			IN								NO.: 04512 RTED ON: 1		PLOT SCALE	
	20'	1												
10'	1	2	3	4	5	6	7	8	9	10	11	12	13	
		15	16	17	18	19	20	21	22	23	24	25	25	
	27	28	29	30	31	32	33	34	35	36	37	38	39	
	40	41	42	43	44	45	46	47	48	49	50	51	52	
	53	54	55	56	57	58	59	60	61	62	63	64	65	
	65	67	68	69	20	71	72	73	74	75	76		78	]110'
	79	80	81	82	83	84	85	86	87	88	89	90	9	
	92	93	94	95	96	97	98	99	100	101	102	103	104	
	105	106	107	108	109	110	<b>S111</b>	37725	113	114	115	116	117	
	1:8	119	120	121	122	123	124	125	126	127	128	129	0	
	131	132	133	134	135	136	137	138	139	140	141	142	143	
	<b>-</b>	<del></del>					- 260'		· · · · · · · · · · · · · · · · · · ·					ᅱ
						,			CONCR	ETE PA	D	t		:
NO	TE: EA	ACH SA	MPLE V	MLL BE	TAKEN	AT T	HE CEN	ITER O	F THE	DESIGN	ATED A	AREA.	FIGURE	11.2
	PPG INDUSTRIES, INC.  SOIL SAMPLING GRID F  CIRCLEVILLE, OHIO  SOUTH PAD (90' X 24													
				<b></b>	ICF		R ENG			DATE: 1	<del></del>		DR.: <b>D.MA</b> J	ERNIK
	PITTSBURGH, PA SCALE: 1"=30' DWG. NO.: FIG11-											FIG11-2		

JOB NO.: 0451200100

PLOT SCALE: 1=1

STARTED ON: 1/5/93

REVISED: 0/00/00



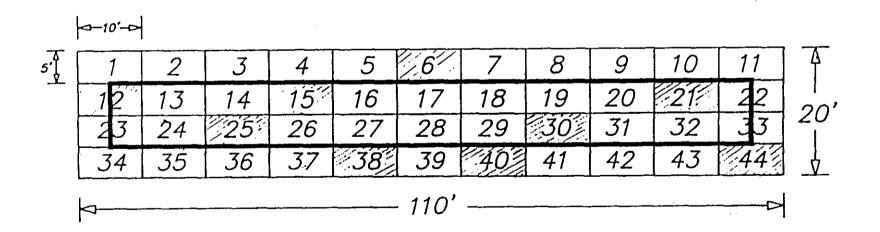


		FIGURE 11.3
PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLING WEST PAD (10'	
ICF KAISER ENGINEERS	DATE: 1/5/93	DR.: D.MAJERNIK
PITTSBURGH, PA	SCALE: 1"=15'	DWG. NO.: FIG11-3

# 12. DESCRIPTION OF REMOVAL EFFORTS

#### 12.1 Incinerator Area

As described in Section 9, initial activities in 1989 were directed toward removal of residues from the Former Liquid Waste Incinerator, associated equipment, waste feed lines and the aqueous waste feed line. Due to the difficulty, expense, and subsequent waste generation, the incinerator and associated equipment was dismantled and treated as a hazardous waste. The incinerator foundation and containment pad concrete were also later removed. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. No soil was deliberately removed from the area, however, some soil was moved incidental to the concrete removal. These materials were loaded directly into rolloff boxes or dump trailers. No waste from this area was stockpiled on site. The materials were transported directly to the Adams Center Landfill in Fort Wayne, Indiana. A summary of wastes removed from this area is included in Table 12.1.

#### 12.2 Still Pad

Results of rinseate analyses of the Still Pad, as described in Section 9, indicated that the concrete met the requirements for clean closure. However, subsequent activities in this area necessitated the removal of the Still Pad concrete. Although this concrete may have been considered "non-hazardous" under 40 CFR part 261, it was disposed of as a hazardous waste. The concrete was broken up and removed down to the underlying soil. The only soil removed was incidental to concrete removal as described in Section 12.1. The concrete was loaded directly onto rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

# 12.3 South Drum Storage Area

The concrete consolidation pad was broken up and removed down to the underlying soil. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. The only soil removed was incidental to concrete removal as described in Section 12.1. The waste was loaded directly into rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

# 12.4 West Drum Storage Pad

Initial sampling in 1989 was described in Section 11 indicated that the existing soils in the West Pad Drum Storage Area met the requirements for a clean closure. As a result, no material was removed from this area during closure activities.

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TABLE 12.1
SUMMARY OF MATERIAL REMOVED

Area	Waste Type	Approximate Quantities Removed (lbs)	Manifest Numbers	
Incinerator	Equipment, refractory	17,140	1484	
		30,480	1485	
		33,200	1486	
Incinerator	Waste feed piping,	31,120	1672	
	foundation, containment pad	30,280	1673	
Still Pad	Concrete, soil	32,040	1654	
	,	28,900	1655	
		31,100	1656	
		37,320	1657	
		40,540	1658	
		28,620	1659	
		34,500	1660	
		26,800	1661	
		37,500	1662	
		51,860	1663	
		26,920	1664	
		28,900	1665	
		29,400	1666	
		29,470	1667	
		40,500	1668	
		40,180	1669	
		28,020	1670	
		29,600	1671	
South Pad	Concrete,			
	Consolidation Pad	29,120	1674	
		,	· ·	

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# 13. SPECIFIC CONSIDERATIONS

This section is reserved for details which are specific for landfill closures. The units covered under this Partial Closure are being clean closed per a risk assessment demonstration. Hence, no specific considerations are applicable.

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# 14. DESCRIPTION OF EQUIPMENT CLEANING

The following describes the equipment cleaning efforts used in the vicinity of each of the interim status hazardous waste management units being closed. Residues generated by the scraping of equipment were handled as hazardous waste. Equipment was placed on a curbed, lined area and a pressure washer was used to remove any contamination. The decontamination areas were visqueen-lined, and large enough to ensure that no overspray was distributed outside the lined area. All recovered water was collected into a sump and then pumped into drums for sampling and analysis. Any rinse water which came in contact with listed hazardous wastes was managed as a listed waste. All decontamination pad plastic lining was disposed of in bulk or drummed and managed as a hazardous waste.

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#### 15. CERTIFICATION

PPG will provide certification that the former Liquid Waste Incinerator and three drum storage pads have been closed in accordance with the approved Partial Closure Plan. An independent registered Professional Engineer was present during critical stages of closure activities, such as incinerator demolition, line flushing and decontamination of the storage pads. The Documentation Report for these 1989 activities is included as Attachment H. This Engineer has documented that Partial Closure activities were performed in accordance with the applicable regulations and were consistent with the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988. Upon approval of this Plan, which includes a risk assessment demonstration of clean closure, an independent registered Professional Engineer will certify that the Partial Closure is in accordance with the approved plan. PPG will certify closure in accordance with 40 CFR 265.115 and OAC 3745-66-15.

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# 16. STATUS OF THE FACILITY AFTER CLOSURE

After the completion of partial closure activities, the Still Pad (see Figure 1.2) was converted to a satellite storage or "less-than-90-day-storage" area. The former Liquid Waste Incinerator in the manufacturing area and the other drum storage areas (the South Pad and West Pad) were permanently closed. The remainder of the hazardous waste management units at the PPG Circleville facility, which includes the ERU and five hazardous waste storage tanks at the resin plant, remain in operation.

ATTACHMENT A

Partial RCRA Closure - Analytical Summary

Partial Closure Plan 04512-01-B Revision: 1 Date: January 6, 1993

	T	T	Τ	1	1	<del></del>	T	T-	<del></del>		
SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	••	7137	CV-89-0221	Still Pad	M.H. Sediment Sample	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right @ Right Ethylbenzene Meth. Chloride Xylenes @ Right	BDL BDL 2.48 0.228 0.335 BDL	mg/kg mg/kg mg/kg mg/kg mg/kg	1.0 Varies 0.167 0.167 0.167 1.0	
			ļ			17-Apr-89	Arodor 1248	6,700	mg/kg mg/kg	1.0	
CV-89-0223	-	7137	CV-89-0222	Still Pad	Pipe Sediment Sample	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right @ Right MEK Xylenes @ Right	BDL BDL 15.3 167.5 BDL	mg/kg mg/kg mg/kg mg/kg mg/kg	1.0 Varies 4.00 4.00 1.0	
				ļ		17-Apr-89	Aroclor 1248	41,400	mg/kg	1.0	
CV-89-0223	<del></del>	7137	CV-89-0223	Still Pad	3rd Rinse	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right Butyl Cellosofve @ Right Meth. Chloride @ Right	BDL 85.4 BDL 169 BDL	mg/kg mg/L μg/L μg/L μg/L	Varies 100	Analysis for Methanol, iso-butanol, & Butanol Initial run results shown, confirmed @ 84.1 mg/L Analysis for HSL Volatiles all BDL except below Analysis for a PCBs and BDL
CV-89-0224	-	7137	CV-89-0224	Still Pad	Rinsewater Source	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	@ Right Methanol @ Right Acetone Meth. Chloride	BDL 6.95 BDL 22.3 3.2	mg/L mg/L µg/L µg/L µg/L	1.0 1.0 Varies 10.0 2.00	
						17-Apr-89	@ Right	BDL	μg/L	1.0	Analyses for 9 PCBs all BDL
8-131	S-131	7137	JC5491	South Pad	Soil Sample	17-Jul-89 17-Jul-89 17-Jul-89	@ Right @ Right Toluene	BDL BDL 2	mg/kg mg/kg mg/kg	0.965 Varica 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL except below
003	S-132	7137	JC5492	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volaties all BDL
004	S-135	7137	JC5493	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.11	mg/kg mg/kg mg/kg	0.972 0.972 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL except below
005	S-136	7137	JC5494	South pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL Q6	mg/kg mg/kg mg/kg	0.950 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL except below
906	S-137	7137	JC5495	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0,971 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
007	S-140	7137	JC54%	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
008	S-130	7137	JC5497	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varica	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
009	S-129	7137	JC5498	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,967 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL, Volatiles alf BDL

#### PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

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SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
010	S-126	7137	JC5499	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0,950 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
011	S-124	7137	JC5500	South pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
012	S-121	7137	JCSS01	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
013	S-107	7137	JC5502	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Toluene	BDL BDL 0.3 0.4	mg/kg mg/kg mg/kg mg/kg	0.971 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
014	S-109	7137	JCSS03	South pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.992 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
015	S-109	7137	JC5530:	Souh Pad	Soil Sample (Dupl. S-109)	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.6	mg/kg mg/kg mg/kg	0.969 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
016	S-113	7137	HC5504	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,993 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
017	S-111	7137	JCSS05	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.967 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
018	S-112	7137	JC5506	South Pad	Soit Sample	18-July-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.977 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
019	\$-115	7137	JC5507	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,973 Varies	Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL
020	S-102	7137	JC5508	South Pad	Soit Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
021	S-100	7137	3C5509	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	Right     Right     Ethylbenzene     Meth. Chloride     Toluene     Xylenes	BDL BDL 2 0.3 21 8	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.6 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
022	S-96	7137	JC5510	South Pad	Soit Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg		Analysis for n-Buşanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
023	S-93	7137	JC5511	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL
024	S-80	7137	JC5512	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.5	mg/kg mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below

#### PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
025	S-88	7137	JC5513	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Toluene	BDL BDL 0.5 2	mg/kg mg/kg mg/kg mg/kg	0,999 Varies 0.3 0.3	Analysis for HSL Volatiles all BDL, except below
026	S-82	7137	JC5514	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.957 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C541	C541	7137	JC3541	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right Arclor 1254	BDL 0.334	mg/kg mg/kg	0.25 0.25	
027	S-77	7137	JC5515	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.966 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
028	576	7137	JC5516	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Toluene Xylenes	BDL BDL 0.3 17 0.16	mg/kg mg/kg mg/kg mg/kg mg/kg	0.993 Varies 0.3 0.3	
029	S-72	7137	JC5517	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Xylenes	BDL BDL 0.4 0.3 0.18	mg/kg mg/kg mg/kg mg/kg mg/kg	1.000 Varies 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
030	S-70	7137	JC5518	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
031	S-69	7137	JC5519	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Toluene Xylenes	BDL BDL 0.3 3 1 1.8	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.990 Varies 0.3 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
032	S-65	7137	JC5520	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chlorde	BDL BDL 0.8	mg/kg mg/kg mg/kg	0.974 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
033	S-65	7137	JC5540	South Pad	Soil Sample (Dupl. S-55)	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL Q3	mg/kg mg/kg mg/kg	0.977 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
034	S-58	7137	JC5521	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Toluene	BDL BDL 0.3	mg/kg mg/kg mg/kg mg/kg	0.962 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
035	S-61	7137	JC5522	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.976 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
036	S-49	7137	JC5523	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

#### PPG-CIRCLEVILLEPARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
037	S-44	7137	JC5524	South Pad	Soil Sample	18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li></ul>	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
038	5-40	7137	JC5525	South Pad	Soil Sample	18-มีเป-89 18-มีเป-89 18-มีเป-89	Right     Right     Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0,964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
039	S-26	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
040	S-34	7137	JC5527	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0,961 Varies	Analysis for n-Butanol, isobutanoi, and Methanol Analysis for HSL Volatiles all BDL
041	S-31	7137	JC5526	South Pad	Soil Sample	[8-Jul-89 [8-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.965 Varies	Analysis for n-Butanol, isobutanol, and Mothanol Analysis for HSL Volatiles all BDL
042	S-38	7137	JC3529	South Pad	Soil Sample	8-Jul-89  8-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.970 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
043	S-26	7137	JC5530	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Right     Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
044	S-24	7137	JC5531	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.953 Varies	Analysis for n-Butanol, isobutanol, and Methenol Analysis for HSL Volatiles all BDL
045	S-21	7137	JC5532	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Righ     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right	BDL BDL	mg/kg mg/kg	0.960 Varice	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
046	S-17	7137	JC5533	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	1.000 Varice	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
047	S-5	7137	JC5534	South Pad	Soil Sample	լ8-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li></ul>	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
048	S-14	7137	JC5535	South Ped	Soil Sample	18-1ग्र-89 (8-1ग्र-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.999 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
049	S-9	7137	JC5536	South Pad	Soil Sample	18-Jui-89 18-Jui-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
050	S-11	7137	JC5537	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.993 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
051	S-13	7137	JC5538	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@Right @Right	BDL BDL	mg/kg mg/kg	0.983 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C544	C544	7137	JC5542	South Pad	Soil Sample	18-Jน1-89 18-Jน1-89	@ Right Aroclor 1254	BDL 3.56 -4%.	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs and BDL, except below
052	-	7137	JC5552	General	Water Sample (Trip Blank)	18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li></ul>	BDL BDL	mg/L mg/L		Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL
053	W-44	7137	JC5543	West Pad	Soil Sample	18-1ग1-89 18-1ग1-89 18-1ग1-89	Right     Methanol     Right     Toluene	BDL 0,968 BDL 1,34	mg/kg mg/kg mg/kg mg/kg	0.988 0.968 Varies 0.196	Analysis for n-Butanol and Isobutanol Only detected alcohol in West Pad soils Analysis for HSL Volatiles, all BDL except below

SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
054	W-21	7137	JC5544	West pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	1 2
055	W-30	7137	JC5545	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
056	W-40	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.988 Varies	
057	W-6	7137	JC3547	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.229 2.16	mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.186 0.186	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
058	W-38	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.621	mg/kg mg/kg mg/kg	0.973 Varies 0.190	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
059	W-15	7137	JC5549	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.977 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
060	W-26	7137	JC5550	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.944 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
061	W-12	7137	JC5551	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.454	mg/kg mg/kg mg/kg	0.979 Varies 0.199	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C542	C542	7137	JC5554	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs, all BDL
062	W-12	7137	JC5553	West Pad	Soil Sample (Dupl. W-12)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	I-9	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Rigut	BDL BDL	mg/kg mg/kg	0,975 Varice	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
064	1-44	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.929 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	1-77	7137	JC5557	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
066	I-64	7137	JC5558	Incinerator Area	soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.3	mg/kg mg/kg mg/kg mg/kg	0:967 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except BDL
067	1-85	7137	JC5559	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.6 0.7	mg/kg mg/kg mg/kg mg/kg	0.996 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
068	1-106	7137	JC5560	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
069	I-72	7137	JC5561	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.962 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

#### PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

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SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
070	I-72	7137	JC5573 <sub>.</sub>	Incinerator Area	Soil Sample (Dupt. 1-72)	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Xylenes	BDL BDL 0.4 1.7	mg/kg mg/kg mg/kg mg/kg	0.933 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
071	1-92	7137	JC5562	Incinerator Area	Soit Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1.000 Varies	,
072	1-70	7137	JC5563	Incinerator Area	Soit Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.944 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
073	1-76	7137	JC5564	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.932 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
074	[-26	7137	JC5565	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.990 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
075	1-58	7137	JC5566	Incinerator Area	Soil Sample	18-Jui-89 18-Jui-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.955 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
076	1-6	7137	JC5567	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
077	I-24	7137	JC3568	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Xylenes	BDL BDL 2 4 4	mg/kg mg/kg mg/kg mg/kg mg/kg	0.969 Varies 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
078	1-26	7137	JC5569	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.992 Varies 0.3	
079	1-48	7137	JC5670	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.978 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
080	1-45	7137	JC5571	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene 2-Hexanone Meth. Chloride Xylenes	BDL BDL 0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg mg/kg	0.945 Varies 0.3 0.6 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
081	1-60	7137	JC5572	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.931 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C543	C543	7137	JC5574	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right Arodor 1254 @ Right HpCDD OCDD 2,37,a-TCDF TCDF	BDL 1.79 BDL 0.37 1.91 0.15	mg/kg mg/kg µg/kg µg/kg µg/kg µg/kg	0.25 0.25 Varies 	Analysis for 7 PCBs all BDL except below  Analysis for 12 Cibenzo-P-Dioxins & Furene all BDL except below

#### PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

			T	1	I Total	<del>T</del>	I	T		1	
				ł		SAMPLE	}	ł	ł	DETECTION	
SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	DATE	ANALYSIS FOR	RESULTS	UNITS	LIMIT	COMMENTS
085		7137	085	Incinerator	Final Phase Line 2	24-Aug-89	Methanol	93.1	mg/L	1.0	
					1	24-Aug-89	[so-Butano]	10.1	mg/L	1.0	
						24-Aug-89	Butanol	86.3	mg/L	1.0	
ĺ				Í	ſ	24-Aug-89	@ Right	BDL	μg/L	Varies	
l				ł	<u> </u>	24-Aug-89	2-Butanone	39,000	μg/L	1,000	
						24-Aug-89	Ethylbenzene	36,000	μg/L	500	
İ						24-Aug-89 24-Aug-89	2-Hexanone Toluene	720,000	μg/L.	1,000 500	
Ì				i		24-Aug-89 24-Aug-89	Xylenes	75,000 240,000	μg/L μg/L	500	
				<del></del>	<del> </del>	Z+Fiug-05	Ayenca	240,000	PE		
086	_	7137	086	Incinerator	Distilled Rinse Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL, except below
				<u> </u>		24-Aug-89	Toluene	170	µg/L	6	
087		7137	087	Incinerator	Service Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
wo, 1	-	1137	<i>W</i> 7	Mencialor	Service Water	24-Aug-89	@ Right	BDL	μg/L		Analysis for HSL Volatiles all BDL
<del></del>							G 1-6-1				
088		7137	068	Incinerator	Travel Blank	24-Aug-89	@ Right	BDL	μg/L	Varies	Analysis for HSL Volatiles all BDL
089		7137	089	Inciperator	Final Rinse Line 1	24-Aug-89	Methanol	16.5	mg/L	1.0	
~~ )		. 7457		, , , care rate r	I Mar relibe pane 1	24-Aug-89	Iso-butanol	1.71	mg/L	10	
I				i		24-Aug-89	Butanol	18.9	mg/L	1.0	
						24-Aug-89	@ Right	BDL	μg/L	Varies	
l						24-Aug-89	2-Butanone	11,000	μg/L	1,000	Analysis for HSL Volatiles all BDL, except below
ŀ						24-Aug-89	Ethylbenzene	24,000	μg/L	1,000	
1						24-Aug-89	2-Hexanone	300,000	ug/L	1,000	
ľ	ĺ			[		24-Aug-89	Toluene	33,000	μg/L	600 600	
					ļ <u></u> _	24-Aug-89	Xylenes	180,000	μg/L	600	
090	_	7137	090	Incinerator	Final Rinse Aqueous Waste	24-Aug-89	@ Right	BDL	mg/L	1.0	
l				1	,	24-Aug-89	@ Right	BDL	μg/L	Varies	
l						24-Aug-89	Ethylbenzene	9,900	μg/L	500	Analysis for HSL Volatiles all BDL, except below
ſ	1			ĺ		24-Aug-89	2-Hexanone	1,900	μg/L	1,000	
ļ						24-Aug-89	Toluene	15,000	μg/L	500	
						24-Aug-89	Xylenes	31,000	μg/L	500	

ATTACHMENT B

Partial RCRA Closure - Detected Compound Summary

Partial Closure Plan 04512-01-B Revision: 1 Date: January 6, 1993

#### PPG - CIRCLEVILLE PARTIAL RCRA CLOSURE - DETECTED COMPOUND SUMMARY

··											Attachment
SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221		7137	CV-89-0221	STILL PAD	M.H. SEDIMENT SAMPLE	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	ETHYLBENZENE METH, CHLORIDE XYLENES ARCOCLOR 1248	2.48 0.228 0.335 6,700	mg/kg mg/kg mg/kg mg/kg	0.167 0.167 0.167 1.0	
CV-89-0222	•	7137	CV-89-0222	SITUL PAD	PIPE SEDIMENT SAMPLE	17-Apr-89 17-Apr-89 17-Apr-89	MEK XYLENES AROCLOR 1248	15,3 167,5 41,400	mg/kg mg/kg mg/kg	4.00 4.00 1.0	
CV-89-0223		7137	CV-89-0723	STILL PAD	3rd RINSE	17-Apr-89 17-Apr-89	BUTYL CELLOSOLVE METH. CHLORIDE	85.4 169	mg/L ug/L	1.0 100	initial run results shown, confirmed @ 84.1 mg/L
CV-89-0224	-	7137	CV-89-0224	STILL PAD	RINSEWATER SOURCE	17-Apr-89 17-Apr-89 17-Apr-89	METHANOL ACETONE METH. CHLORIDE	6.95 22.3 3.2	mg/L ug/L ug/L	1.0 10.0 2.0	
S-131	S-131	7137	S-131	SOUTH PAD	SOIL SAMPLE	17-Jul-89	TOLUENE	2	mg/kg	0.3	
004	S-135	7137	004	SOUTH PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.11	mg/kg	0.3	
005	S-136	7137	005	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	. 0.8	mg/kg	0.3	
010	S-126	7137	010	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
013	S-107	7137	013	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH, CHLORIDE TOLUENE	0.3 0.4	mg/kg mg/kg	0.3 0.3	
015	S- 109	7137	015	SOUTH PAD	SOIL SAMPLE (DUPL, S-109)	18-Jui-89	XYLENES	0.6	mg/kg	0.3	
018	S-112	7137	018	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0,4	mg/kg	0.3	
021	S-100	7137	021	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE TOLUENE XYLENES	2 0.3 21 8	mg/kg mg/kg mg/kg mg/kg	0.6 0.3 0.3 0.3	
024	S-80	7137	024	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0,5	mg/kg	0.3	
025	S-88	7137	025	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH, CHLORIDE TOLUENE	0.5 2	mg/kg mg/kg	0.3 0.3	
C541	C541	7137	JC6641	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	0.334	mg/kg	0.25	
027	S-77	7137	027	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
028	S-71	7137	028	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE TOLUENE XYLENES	0.3 17 0.16	mg/kg mg/kg mg/kg	0.3 0.3 0.3	•
029	S-72	7137	029	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	0.4 0.3 0.18	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
031	S-69	7137	031	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE TOLUENE XYLENES	0.3 3 1 1.8	mg/kg mg/kg mg/kg mg/kg	9.3 0.3 0.3 0.3	

#### PPG - CIRCLEVILLE PARTIAL RCRA CLOSURE - DETECTED COMPOUND SUMMARY

			I "	I			<u> </u>	T		W. Color	
SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION	COMMENTS
032	S-55	7137	032	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH, CHLORIDE	0.8	mg/kg	0.3	
033	S-55	7137	033	SOUTH PAD	SOIL SAMPLE (DUPL, S-55)	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
034	S-58	7137	034	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH, CHLORIDE TOLUENE	0.3 0.3	mg/kg mg/kg	0.3 0.3	·
035	S-61	7137	035	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.3	mg/kg	0.3	
038	S-40	7137	038	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
C544	C544	7137	JC5542	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	3.56	mg/kg	0.25	
053	W-44	7137	JC5543	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METHANOL TOLUENE	0.968 1.34	mg/kg mg/kg	0.968 0.198	Only detected alcohol in West Pad soils
057	W-6	7137	JC5547	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.229 2.16	mg/kg mg/kg	0.186 0.186	
058	W-38	7137	JC5548	WEST PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.621	mg/kg	0.190	
061	W-12	7137	JC5551	WEST PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.454	mg/kg	0.199	
066	1-64	7137	066	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.3 0.9	mg/kg mg/kg	0.3 0.3	
067	1-85	7137	067	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.6 0.7	mg/kg mg/kg	0.3 0.3	
070	1-72	7137	070	INCINERATOR AREA	SOIL SAMPLE (DUPL 1-72)	18-Jul-89 18-Jul-89	METH CHLORIDE XYLENES	0.4 1.7	mg/kg mg/kg	0.3 0.3	·
072	1-70	7137	072	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
077	1-24	7137	077	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	2 4 4	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
078	1-28	7137	078	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH CHLORIDE	0.3	mg/kg	0.3	
079	1-48	7137	079	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	XYLENES	0.4	mg/kg	0.3	
080	1-45	7137	080	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE 2-HEXANONE METH. CHLORIDE XYLENES	0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg	0.3 0.6 0.3 0.3	ì
061	I-50	7137	081	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	AROCLOR 1254 HpCDD OCDD 2,3,7,8-TCDF TCDP	1.79 0.37 1.91 0.15 0.22	mg/kg ug/kg ug/kg ug/kg ug/kg	0.25	

SAMPLE #	LOC#	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
085		7137	085	INCINERATOR	FINAL RINSE LINE 2	24 Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	METHANOL ISO-BUTANOL BUTANOL 2-BUTANONE ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	93.1 10.1 85.3 39,000 36,000 720,000 75,000 240,000	mg/L mg/L mg/L ug/L ug/L ug/L ug/L ug/L	1.0 1.0 1.0 1,000 500 1,000 500	
086	·	7137	086	INCINERATOR	DISTILLED RINSE WATER	24-Aug-89	TOLUENE	170	ug/L	5	
089	•	7137	089	INCINERATOR	FINAL RINSE LINE 1	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	METHANOL ISO-BUTANOL BUTANOL 2-BUTANONE ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	16.5 1.71 18.9 11,000 24,000 300,000 33,000 180,000	mg/L mg/L mg/L ug/L ug/L ug/L ug/L	1.0 1.0 1.0 1,000 1,000 1,000 500 500	
090	-	7137	090	INCINERATOR	FINAL RINSE AQUEOUS WASTE	24-Aug-89	ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	9,900 1,900 15,000 31,000	ug/L ug/L ug/L ug/L	500 1,000 500 500	
CV-89-1503	-	9-21-89	12372-89	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89 18-Sep-89	@RIGHT BARIUM	BDL 1.1	mg/L mg/L	VARIES UNKNOWN	TCLP Analysis for 8 RCRA metals at BDL except below
CV-89-1503	-	9-21-89	9697	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89	@RIGHT	BDL	ug/i.	VARIES	TCLP Analysis for 25 RCRA organics all BDL

### ATTACHMENT C

Addendum to Sampling Activities
Associated with Partial Closure Plan

Partial Closure Plan 04512-01-B Revision: 1 Date: January 6, 1993

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# ADDENDUM TO SAMPLING ACTIVITIES ASSOCIATED WITH PARTIAL CLOSURE PLAN

# **FOR**

# PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO

## Prepared for:

PPG INDUSTRIES, INC. Coatings and Resins Circleville, Ohio

Prepared by:

ICF KAISER ENGINEERS, INC. Four Gateway Center Pittsburgh, Pennsylvania 15222

December, 1992

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#### 1.0 ADDENDUM INTRODUCTION

On January 14, 1991, PPG Industries, Inc. submitted a revised partial closure plan for four interim status RCRA TSD units identified as the Still Pad Drum Storage Area, West Drum Storage Pad, the South Drum Storage Pad, and the Former Liquid Waste Incinerator. Since the submittal of the revised plan, PPG and OEPA have engaged in several rounds of negotiations centering around the definition of the full extent of contamination attributed to three of these RCRA units, (West Drum Storage Pad, South Drum Storage Pad, and the Liquid Waste Incinerator).

This addendum presents a description of the field sampling conducted as a result of negotiations with OEPA, the results of sample analysis and a brief discussion of the results.

Contracting Contracts

#### 2.0 SAMPLING AND ANALYSIS PLAN

#### 2.1 INTRODUCTION

The purpose of this section is to describe the sampling methodology and analysis associated with the collection of soil samples offered in response to OEPA comments as presented in PPG's letters dated July 27, 1992, and August 7, 1992. The Proposed Sampling Program was subsequently approved by the Ohio EPA on August 31, 1992. Appendix A includes copies of the correspondence.

#### 2.2 FIELD SAMPLING ACTIVITIES

#### 2.2.1 Re-establishment of Grids

On September 21 and 22, 1992 a two man sampling crew re-established the sampling grid system originally associated with the closure activities of the Former Liquid Incinerator Pad, the West Pad Drum Storage Area, and the South Pad Drum Storage Area. As part of this activity, additional grids, as concurred with OEPA, were established to further define the possible extent of contamination.

Due to a missed holding time for some of the samples obtained from grids at the 12-24 inch interval on September 21-22, 1992, additional sampling was performed on October 31, 1992. Five additional soil samples and one field blank were obtained at that time. The location and sampling grids are presented below.

Former Liquid Incinerator Pad Grids 24 and 45

■ South Pad Drum Storage Grid 100

■ West Pad Drum Storage Grids 6 and 44

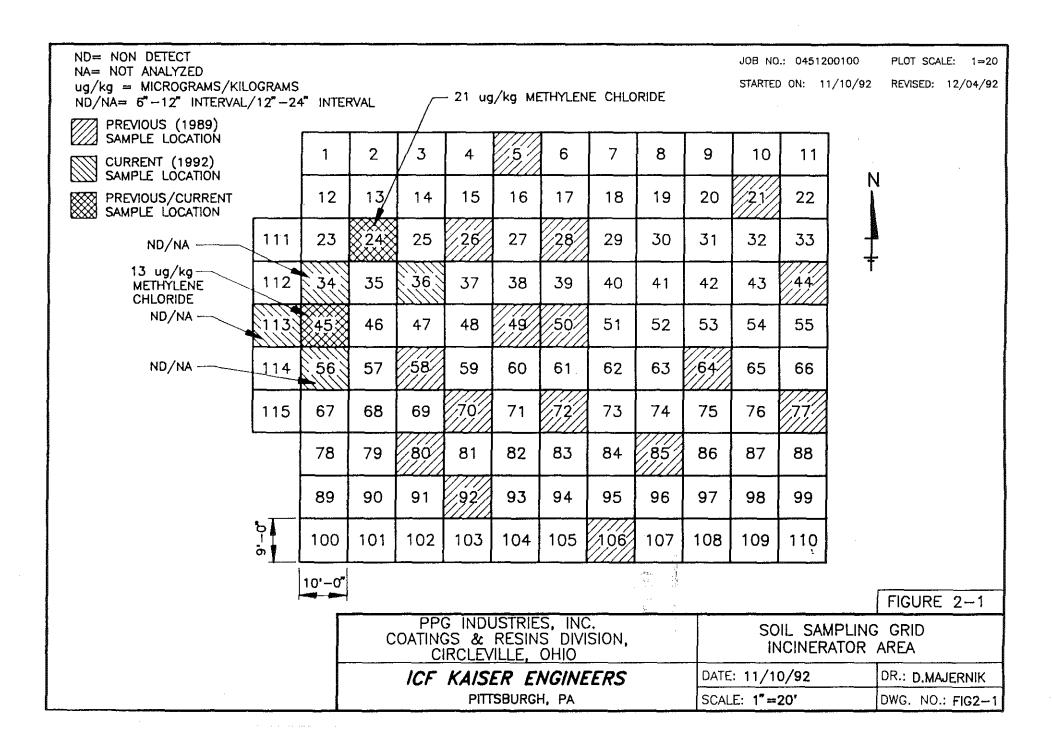
All sampling was performed following the same methodology used in prior sampling events. No variation of methods occurred.

#### 2.2.1.1 Former Liquid Incinerator Area

Sampling Grids 24, 34-36, 45-47 and 56-58 were re-established. Sampling grids 111-115 were added to the western boundary of the existing grid system. As part of the Former Liquid Incinerator Pad grid re-establishment procedure, the location of the former incinerator stack was verified from photos and previous work performed by plant personnel. Figure 2-1 illustrates the sample grid.

#### 2.2.1.2 West Pad Drum Storage

Along with the re-establishment of the former grid system, 16 new sampling grids were added. Grids 45-60 were added to the western and northern boundaries of the existing grid system. Figure 2-2 illustrates the sampling grid.



ND= NON DETECT JOB NO.: 0451200100 PLOT SCALE: 1=15 NA- NOT ANALYZED ug/kg = MICROGRAM/KILOGRAM STARTED ON: 11/10/92 REVISED: 12/04/92 ND/NA= 6"-12" INTERVAL/12"--24" INTERVAL PREVIOUS (1989) SAMPLE LOCATION CURRENT (1992) SAMPLE LOCATION PREVIOUS/CURRENT SAMPLE LOCATION 120'-0" 10'-0" ND/NA ND/NA ND/NA-`56 `5ì 46 47 48 49 50 52 53 54 55 ₹**6**₹ 8 57 2 4 5 7 9 10 11 3 15 58 13 16 17 18 19 20 22 14 30 25 32 59 23 24 26 27 28 29 31 33 40 35 36 37 39 43 34 42 41 - ND - ND/NA CONCRETE CURB FIGURE 2-2 PPG INDUSTRIES, INC. SOIL SAMPLING GRID

COATINGS & RESINS DIVISION,

ICF KAISER ENGINEERS

PITTSBURGH, PA

CIRCLEVILLE. OHIO

WEST PAD CLOSURE

DR.: D.MAJERNIK

DWG. NO.: FIG2-2

DATE: 11/10/92

SCALE: 1"=15'

#### 2.2.1.3 South Pad Drum Storage

Within the South Pad Drum Storage area previous grids 53, 66, 79, 92, 100 and 105 were reestablished. Additional grids, 144-154, were added to the west and southern portions of the grid system. Figure 2-3 illustrates the sampling grids.

#### 2.2.2 Soil Sampling Methodology

Soil samples obtained from new grids were collected at depths of 6-12 inches and 12-24 inches below the ground surface. A biased sampling approach was used to obtain samples from grids previously determined to contain detectable levels of chemicals. These samples were collected at a depth of 12-24 inches below the ground surface. Table 1 summarizes the grid numbers and sampling depths for each closure unit.

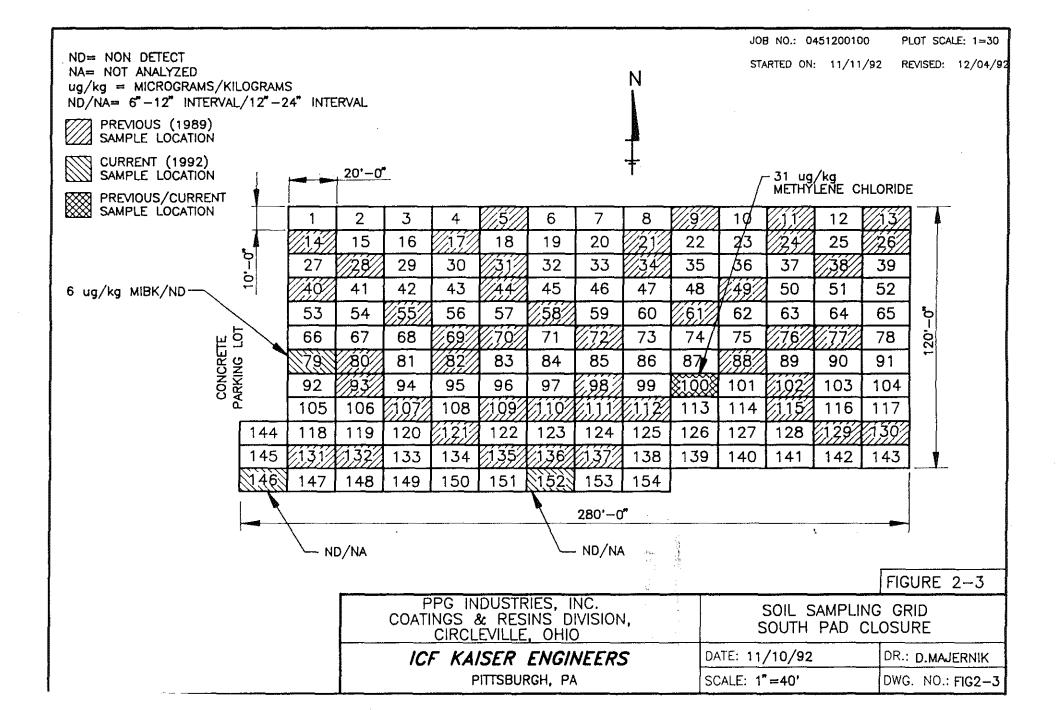
All samples were collected utilizing the following procedures. The first 6 inches of soil was removed using a hand-held stainless steel bucket auger. A stainless steel split-spoon was then manually driven to the desired depth to obtain the deeper sample. All sampling equipment was decontaminated between sample locations with a mild detergent followed by a deionized water rinse.

Approximately 4 oz. of material was collected from each split spoon for analysis. The sample was obtained by withdrawing the appropriate amount of soil from the split-spoon with stainless steel spatulas. Labels detailing, the name of the sampler, date, time, method of analysis and any preservatives were marked on the sampling jar. The samples were then placed on ice for shipment to the analytical laboratory.

#### 2.2.3 Sample Analysis

All soil samples were sent by overnight courier to NET, Cambridge Division in Bedford, Massachusetts for analysis. Soil samples were analyzed for Volatile Organic Compounds (VOCs) by EPA SW-846 Method 8240. Samples from the 6-12 inch depth interval were analyzed under a turnaround time of 5 days. The accelerated turnaround time allowed the corresponding 12-24 inch interval samples to be analyzed within the required holding time of 14 days. The initial soil samples were received at the NET Laboratories on September 24 and 25, 1992 and were analyzed by September 30, 1992. The second round of samples were received at the lab on November 2, 1992 and were analyzed by November 6, 1992.

A field blank was submitted to NET for each day of field activity for a total of three samples. NET ran a method blank at the beginning and end of each sample batch. A total of six method blanks were run.



#### 3.0 INVESTIGATION RESULTS

With the exception of sample CV-92-350-579, all of the initially analyzed samples obtained on September 21-22, 1992 showed non-detectable levels of VOCs. Sample CV-92-350-529 was obtained from Grid 79 at the South Pad Drum Storage Area at the 6-12 inch interval. The sample exhibited a trace concentration of 6.0 ug/kg 4-methyl-2-pentanone (MIBK). A summary of analytical results is included in Table 3-1. Raw analytical data are included as Appendix B.

Three of the five samples analyzed during the second sampling event (October 31, 1992) exhibited detectable concentrations of methylene chloride. These samples, as stated earlier, were obtained from grids previously determined to contain detectable levels of chemicals. Within the Former Liquid Incinerator Pad, the 12-24 inch sample from Grid 24 contained methylene chloride at 21 ug/kg and the 12-24 inch sample from Grid 45 contained methylene chloride at 13 ug/kg. In the South Pad Drum Storage Area, the 12-24 inch sample from Grid 100 exhibited a concentration of 31 µg/kg methylene chloride. None of the West Drum Storage Pad samples showed detectable concentrations of VOCs.

04512-03-A

TABLE 3-1
SOIL SAMPLE SUMMARY
PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO

# SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-330-I34	Incinerator Pad	34	9-24-92	6-12	8240	Non-Detect
CV-92-331-134	Incinerator Pad	34	9-24-92	12-24	8240	Not Analyzed
CV-92-332-I36	Incinerator Pad	36	9-24-92	6-12	8240	Non-Detect
CV-92-333-I36	Incinerator Pad	. 36	9-24-92	12-24	8240	Not Analyzed
CV-92-334-I56	Incinerator Pad	56	9-24-92	6-12	8240	Non-Detect
CV-92-335-156	Incinerator Pad	56	9-24-92	12-24	8240	Not Analyzed
CV-92-336-I113	Incinerator Pad	113	9-24-92	6-12	8240	Non-Detect
CV-92-337-I113	Incinerator Pad	113	9-24-92	12-24	8240	Not Analyzed
CV-92-338-I24	Incinerator Pad	24	9-24-92	12-24	8240	Not Analyzed
CV-92-339-I45	Incinerator Pad	45	9-24-92	12-24	8240	Not Analyzed
CV-92-524-52A	Incinerator Pad	24	10-31-92	12-24	8240	21 ppb Methylene Chloride
CV-92-525-I45	Incinerator Pad	45	10-31-92	12-24	8240	13 ppb Methylene Chloride
CV-92-340-W45	West Storage Pad	45	9-23-92	6-12	8240	Non-Detect
CV-92-341-W45	West Storage Pad	45	9-23-92	12-24	8240	Not Analyzed
CV-92-342-W51	West Storage Pad	51	9-23-92	6-12	8240	Non-Detect
CV-92-343-W51	West Storage Pad	51	9-23-92	12-24	8240 8240	Not Analyzed
CV-92-344-W56	West Storage Pad	56	9-23-92	6-12	8240	Non-Detect
CV-92-345-W56	West Storage Pad	56	9-23-92	12-24	8240	Not Analyzed
CV-92-346-W60	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-347-W60A	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect

TABLE 3-1 (Continued)

# SAMPLES COLLECTED AT THE CIRCLEVILLE, OHIO FACILITY

# SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-359-W60A	West Storage Pad	60	9-23-92	12-24	8240	Not Analyzed
CV-92-348-W6	West Storage Pad	6	9-23-92	12-24	8240	Not Analyzed
CV-92-349-W44	West Storage Pad	44	9-23-92	12-24	8240	Not Analyzed
CV-92-W6	West Storage Pad	6	10-31-92	12-24	8240	Non-Detect
CV-92W44	West Storage Pad	44	10-31-92	12-24	8240	Non-Detect
CV-92-350-S79	South Storage Pad	79	9-23-92	6-12	8240	6 ppb MIBK
CV-92-351-S79	South Storage Pad	79	9-23-92	12-24	8240	Non-Detect
CV-92-354-S152	South Storage Pad	152	9-23-92	6-12	8240	Non-Detect
CV-92-355-S152	South Storage Pad	152	9-23-92	12-24	8240	Not Analyzed
CV-92-360-S146	South Storage Pad	146	9-24-92	6-12	8240	Non-Detect
CV-92-353-\$146	South Storage Pad	146	9-24-92	12-24	8240	Not Analyzed
CV-92-356-\$100	South Storage Pad	100	9-23-92	12-24	8240	Not Analyzed
CV-92-526-S100	South Storage Pad	100	10-31-92	12-24	8240	31 ppb Methylene Chloride

PPB: Parts Per Billion

#### 4.0 DISCUSSION OF RESULTS

The results of the 18 samples analyzed as part of the additional sampling program conducted in September and October 1992 can be summarized as follows:

- Fourteen (14) of the samples showed nondetectable levels of VOCs, including all of the samples taken in the West Drum Storage Pad.
- The samples collected from Grid No. 79 in the South Drum Storage Pad showed 6 ppb of MIBK (which is equivalent to the method detection limit for the compound) at the 6"-12" depth, but no detectable VOCs at the 12" 24" depth. The 12" 24" depth sample from Grid 100 in the South Drum Storage Pad area showed detectable levels of methylene chloride.
- The 12"-24" depth samples from grids 24 and 45 in the Former Liquid Incinerator area showed detectable levels of methylene chloride.

Of the methylene chloride detected in three of the samples obtained during this sampling effort, Table 4-1 shows that the levels detected are at least an order of magnitude lower than the methylene chloride in 6"-12" samples from the same grid locations collected in 1989. These results suggest that higher concentrations at intervals deeper than 12"-24" are unlikely.

# TABLE 4-1 METHYLENE CHLORIDE DATA SUMMARY (All Concentrations in ug/kg)

(All Concentrations in μg/kg)

Sampling Interval	Liquid :	Incinerator	South Drum Storage Pad			
	Grid 24	Grid 45	Grid 100			
6"-12" Interval (1989)	4,000	400	300			
12"-24" Interval (1992)	21	13	31			

Based on the analytical results reduced from this recent sampling event, the lateral extent of contamination within each of the three closure areas, (Former Liquid Incinerator Pad, West and South Drum Storage Pads) has been adequately defined. None of the chemicals of concern observed in the previous sampling event were observed in the current sampling event with the exception of methylene chloride and the data indicate that methylene chloride does not increase in concentration with depth. Furthermore, methylene chloride was only observed within the previously sampled grids.

The data obtained from this latest round of sampling will be incorporated into the existing data base for each unit to calculate site risks. Although PPG believes that Ohio EPA's guidance on risk-based RCRA unit closure is based on extremely conservative exposure scenarios, the guidance will be utilized to demonstrate that acceptable levels of risk are present at the three interim status hazardous waste management units and conditions are acceptable for closure.

# APPENDIX A

# ADDITIONAL SAMPLING PROGRAM CORRESPONDENCE

04512-03-A

#### Central District Office

Street Address: 2305 Westbrooke Drive, Building C Columbus, Ohio 43228 614-771-7505 FAX 614-771-7571 Malling Address: P.O. Box 2198 Columbus, Ohio 43266-2198 George V. Voinovich
Governor
Donald R. Schregardus
Director

August 31, 1992

RE: Closure Appeal Settlement, Partial Closure Plan Three drum storage areas and liquid waste incinerator OHD 004 304 689/01-65-0063

Mr. Larry LaDage Plant Manager PPG Industries, Incorporated P.O. Box 457 Circleville, Ohio 43113

Dear Mr. LaDage:

The Ohio EPA has reviewed PPG Industries' July 27, 1992 and subsequent August 7, 1992 proposals for revising the partial closure plan for the three drum storage areas and the old liquid waste incinerator site. With the changes included from the August 7, 1992 revision, the Ohio EPA finds the proposed sampling plan acceptable and approves its implementation. Please contact me prior to the start of sampling so that I may be present to observe operations and procedures. Results from the sample analysis should be submitted to this office for review and evaluation as to whether the full extent of both vertical and horizontal contamination has been determined.

If you have any questions or require further information, please feel free to contact either myself at (614) 771-7505 or Sandra Leibfritz at (614) 644-2956.

Sincerely,

John Paulian

Division of Hazardous Waste Management Central District Office

central pistrict office

JP/sc

cc: Chris Korleski, AGO Sandra Leibfritz, DHWM, CO Bryant Riley, PPG



# PPG Industries, Inc. Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

August 7, 1992

Mr. John Paulain Ohio EPA Central District Office Division of Hazardous Waste Management 2305 Westbrooke Drive, Building C Columbus, Ohio 43228

Re: Closure Plan

Three Drum Storage Areas & Liquid Incinerator

OHD004304689

Dear John:

In reference to our discussion during your site visit on Tuesday, August 4, PPG Industries amends the following item in our July 27, 1992 letter regarding the Partial Closure at the Circleville, Ohio facility:

#### Item 3. Additional Sampling:

a. INCINERATOR AREA: In order to further define the extent of contamination as determined by the previous round of sampling, additional sampling grids are added to the western boundary of the existing incinerator area grid (see attached Figure 1 Revision 1.0). Using the biased sampling approach, an additional sample will be obtained from grid 113. Sampling method and analytical protocol will be the same as described in the proposal of July 27.

Please feel free to call if you have any questions.

Sincerely yours,

Bryant Rilev

cc: M. Broz, PPG

J. Karas, PPG

C. Waterman, Bricker & Eckler

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# PPG Industries, Inc. Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

July 27, 1992

Mr. John Paulian OhioEPA Central District Office Division of Hazardous Waste Management 2305 Westbrooke Dive, Building C Columbus, Ohio 43228

Re: Closure Plan

Three Drum Storage Areas & Liquid Incinerator

OHD 004 304 689

Dear Mr. Paulian:

This letter is being provided in response to the letter from you dated June 1, 1992 regarding the Partial Closure Plan for three drum storage areas and the liquid incinerator at PPG Industries, Inc. (PPG) facility in Circleville, Ohio. We offer the following responses to the items in that letter:

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#### Item 1. PCB Contamination:

Documentation that PCB levels recorded in the south pad soils and in the incinerator soils are unrelated to RCRA activities will be included in the revised Partial Closure Plan. The Partial Closure Plan will be revised to reflect the approved responses to OEPA comments after OEPA concurrence with the contents of this letter.

#### Item 2. Corrective action levels:

We acknowledge your response to this item.

#### Item 3. Additional Sampling:

a. INCINERATOR AREA: PPG proposes to use already established sampling grids 34-36, 45-47 and 56-58 to further characterize soils to the north and west of the old incinerator (See attached Figure 1). A biased sampling approach will be used and soil samples will be obtained from grids 34, 36 and 56. Samples from these grids will be taken at depths of 6-12 inches and 12-24

inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 24 and 45 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination. (Note that, as indicated in Figure 1, a stairway is presently located in a portion of Grid 24.)

WEST PAD AREA: PPG proposes to use 16 new sampling grids (45 to 60) along the north and western boundaries of the existing grid to further characterize soils to the north and west of the west pad area (See attached Figure 2). A biased sampling approach will be used and soil samples will be obtained from grids 45, 51, 56 and 60. \*\*Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 6 and 44 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

SOUTH PAD AREA: A truck parking pad (concrete slab) is located directly adjacent and west of the existing grid system for the South Pad. For this reason, PPG proposes to use 5 existing grids which were not previously sampled (53, 66, 79, 92 and 105) as well as 11 new sampling grids (144 to 154) to further characterize soils to the southwest of the pad (See attached Figure 3). The new grids will include a one grid extension to the west of grids 118 and 131 and a one grid extension south of grids 131 through 138. A biased sampling approach will be used and soil samples will be obtained from grids 79, 146, and 152. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, detected at the 6-12 inch depth. A sample will also be taken beneath previously sampled grid 100 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

The analysis of the samples will be performed using SW-846, Method 8240. Samples will be collected by advancing

a hand or power auger to the specified depth and then collecting the sample in a soil probe.

- b. proposed sampling for extent of vertical contamination under a. above.
- c. If the results of the additional sampling program proposed under a. above do not result in a clear demarcation of the RCRA units of concern subject to closure activities, then PPG will provide information concerning past site operations and management practices.
- We acknowledge your comment on this item. d.
- We acknowledge your comment on this item. e.

PPG is requesting a response to this letter within two (2) weeks of its receipt so that sampling activities can be initiated in an expeditious manner. Note that we will inform you prior to the actual start of the sampling program so that you may be present to observe the sampling activities.

After the contents of this letter are approved and the additional sampling is completed, PPG intends to modify the Partial Closure Plan to reflect the approved responses and sampling results.

Please feel free to call if you have any questions.

Sincerely,

Larry LaDage

Plant Manager

M. Broz, PPG/file CR 310 (1992)

IW Weder for L. La Oagl

J. Karas, PPG

B. Riley, PPG

C. Waterman, Bricker & Eckler

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PPG INDUSTRIES, INC.	SCALE: 1'=30'-0'
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	DATE: 7/20/92 BY: B. Riley
SDIL SAMPLING GRID, SOUTH PAD CLOSURE	FIGURE 3

# APPENDIX B LABORATORY RAW DATA

### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Project:

PPG RUSH SOIL VOAs

09/30/1992

NET Job Number: 92.34112

National Environmental Testing

NET Atlantic, Inc. Cambridge Division 12 Oak Park Bedford, MA 01730



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# **NET Cambridge Division**

#### **ANALYTICAL REPORT**

Report To:

Reported By:

Mr. Robert Bear 1CF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222 National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, NA 01730

Report Date: 09/30/1992

Collected By: ICF

NET Job Number: 92.34112

Project: PPG RUSH SOIL VOAs

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs

Airbill No: 4450798251

NET Client No: 49655

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This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler NET Project Manager Michael F. Delaney, Ph.D. Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE	NET	DATE	TIME	DATE	
ID	ID	TAKEN	TAKEN	REC'D	MATRIX
CV-92-350-S79	67046	09/23/1992	16:45	09/24/1992	\$01L
CV-92-354-\$152	67047	09/23/1992	17:10	09/24/1992	SOIL
CV-92-340-W45	67048	09/23/1992	13:38	09/24/1992	SOIL
CV-92-342-W51	67049	09/23/1992	10:50	09/24/1992	SOIL
CV-92-344-W56	67050	09/23/1992	12:19	09/24/1992	SOIL
CV-92-346-W60	67051	09/23/1992	12:50	09/24/1992	SOIL
CV-92-347-W60A	67052	09/23/1992	13:10	09/24/1992	SOIL
CV-92-351-FBW	67053	09/23/1992	13:10	09/24/1992	BLANK
CV-92-330-134	67138	09/24/1992	09:06	09/25/1992	SOIL
CV-92-332-136	67139	09/24/1992	09:32	09/25/1992	<b>S</b> 01L
CV-92-334-156	67140	09/24/1992	08:30	09/25/1992	SOIL
CV-92-336-1113	67141	09/24/1992	08:30	09/25/1992	SOIL
CV-92-358-FBI	67142	09/24/1992	10:15	09/25/1992	BLANK
CV-92-360-\$146	67143	09/24/1992	11:20	09/25/1992	SOIL



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-350-S79

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					•
Acetone	<5.0	ug/Kg	09/25/1992	dry	
Benzene	<5.0	ug/Kg		,	
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			3
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chlorobenzene	<5.0	ug/Kg			
Chioroethane	<5.0	ug/Kg	•		
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg			
Chioromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichiorobenzene	<5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	6	ug/Kg			
Hethylene Chloride	<5.0	ug/Kg			
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1,2-Trichloroethane	<5.0	ug/Kg			
Trichloroethene	<5.0				
Trichlorofluoromethane	<5.0 <5.0	ug/Kg			
Vinyl Acetate	<5.0 <5.0	ug/Kg			
Vinyl Chloride	<5.0 <5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0 <5.0	ug/Kg			
•		ug/Kg			
p-Xylene	<5.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-354-S152

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	09/25/1992	dry	
Benzene	<b>46.0</b>	ug/Kg	07/23/1972	ui y	
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			
Bromomethane	<6.0	ug/Kg			
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chil orobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichtorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichioroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Nexanone	<6.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
Toluene	<6.0	ug/Kg			
1,1,1-Trichioroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<b>&lt;6.0</b>	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	<6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
Vinyl Chloride	<6.0	ug/Kg			
R-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-340-W45

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	09/25/1992	dry	
Benzene	<6.0	ug/Kg			." - "
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			1 4 1
Bromomethane	≪6.0	ug/Kg			
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<b>&lt;6.</b> 0	ug/Kg			
1,3-Dichtorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Hexanone	<b>&lt;</b> 6.0	ug/Kg			
4-Methyl-2-pentanone (NIBK	<6.0	ug/Kg			
Methylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
Toluene	<6.0	ug/Kg			
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<6.0	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	<6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
Vinyl Chloride	<6.0	ug/Kg			
m-Xylene	⋖6.0	ug/Kg			
a-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-342-W51

Parameter	Result	Units	Analysis Date	Analyst	
			•••••		
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	09/25/1992	dry	
Benzene	<6.0	ug/Kg			. ***
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			Ē
Bromomethane	<6.0	ug/Kg			
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chiorobenzene	<b>&lt;6.</b> 0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<b>&lt;6.</b> 0	ug/Kg			
1,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Rexanone	<6.0	ug/Kg	•		
4-Nethyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<b>&lt;</b> 6.0	ug/Kg			
Toluene	<b>&lt;</b> 6.0	ug/Kg			
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<b>&lt;6.</b> 0	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	` <6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
Vinyl Chloride	<6.0	ug/Kg			
m-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-344-W56

			Analysis	<b>.</b>	
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					
Acetone	<5.0	ug/Kg	09/25/1992	daye	
Benzene	<5.0	ug/Kg	07/23/1772	dry	
Bromodichloromethane	<5.0	ug/Kg			
Bronoform	<5.0	ug/Kg			
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chlorobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg	•		
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	<5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg			
Methylene Chloride	<5.0	ug/Kg			
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1,2-Trichloroethane	<5.0	ug/Kg			
Trichtoroethene	<5.0	ug/Kg			
Trichlorofluoromethane	<5.0	ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0	ug/Kg			
p-Xylene	<5.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-346-W60

			Analysis	
Perameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg	-	
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chiorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochtoromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg	•	
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<b>&lt;</b> 6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Hethylene Chloride	<6.0	ug/Kg		
Styrene	<b>&lt;6.0</b>	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	≪6.0	ug/Kg		
Trichlorofluoromethane	≪6.0	ug/Kg		
Vinyl Acetate	≪6.0	ug/Kg		
Vinyl Chloride	≪6.0	ug/Kg		
m-Xy lene	<6.0	ug/Kg		
o-Xylene	≪6.0	ug/Kg		
p-Xylene	<6.0 <6.0	ug/Kg		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-347-W60A

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					•
Acetone	<5.0	ug/Kg	09/25/1992	dry	
Benzene	<5.0	ug/Kg		-	"
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chlorobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chioroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg			
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	<5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg			
Methylene Chloride	<5.0	ug/Kg			
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1,2-Trichloroethane	<5.0	ug/Kg			
Trichloroethene	<5.0	ug/Kg			
Trichlorofluoromethane	<5.0	ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0	ug/Kg			
p-Xylene	<5.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-FBW

			Analysis	
Parameter	Result	Units	Date	Analyst
***************************************				
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	09/30/1992	nof w
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chioroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochtoromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		
F 117 10110	·3.0	ug/L		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

MET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

\$ 10 m 20 0 m

Sample ID: CV-92-330-134

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	09/29/1992	dry	
Benzene	<6.0	ug/Kg	**********	,	
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			
Bromomethane	<6.0	ug/Kg			
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichtorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropene	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Hexanone	<6.0	ug/Kg	•		
Wethyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chioride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg ug/Kg			
Tetrachloroethene	<6.0	ug/kg ug/Kg			
Toluene	<6.0				
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<6.0	ug/Kg			
richloroethene	<b>₹</b> 6.0	ug/Kg			
richtoroethene	<6.0	ug/Kg			
/inyl Acetate	<6.0	ug/Kg			
/inyl Chloride	<b>₹6.0</b>	ug/Kg			
rinyt chtorige R-Xylene	<b>₹6.0</b>	ug/Kg			
e-xytene o-Xytene		ug/Kg			
-	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-332-136

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S		**	••••••••		
Acetone	<b>&lt;</b> 6.0	ug/Kg	09/29/1992	dry	
Benzene	<6.0	ug/Kg	07/27/1772	uiry	
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			
Bromomethane	<6.0	ug/Kg			
2-Butanone (NEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachioride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<b>&lt;6.0</b>	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	≪6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Rexanone	<6.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<b>&lt;6.</b> 0	ug/Kg			
Methylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
Toluene	<b>&lt;6.</b> 0	ug/Kg			
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<b>&lt;6.</b> 0	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	<6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
/inyl Chloride	<6.0	ug/Kg			
n-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			



Report Date: 09/30/1992

Report To: 1CF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-334-156

			Analysis		
Parameter	Result	Units	Date	Analyst	
CL Volatiles by GC/MS 8240 S				••••••	
Acetone	<6.0	ug/Kg	09/29/1992	dry	
Benzene	<6.0	ug/Kg		•	
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			
Bromomethane	<6.0	ug/Kg			
?-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
ibromochloromethane	<6.0	ug/Kg			
i,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1.1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
l,2-Dichloropropane	<6.0	ug/Kg			
is-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Hexanone	<6.0	ug/Kg			
-Methyl-2-pentanone (MIBK	<6.0	ug/Kg			
lethylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
etrachloroethene	<b>₹6.0</b>	ug/Kg			
foluene	<6.0	ug/Kg			
,1,1-Trichloroethane	<b>₹6.0</b>	ug/Kg			
1.1.2-Trichloroethane	٠٠.0 ح6.0	ug/Kg			
richloroethene	<6.0	ug/Kg			
richlorofluoromethane	<6.0	ug/Kg ug/Kg			
/inyl Acetate	<b>₹6.0</b>	ug/Kg			
/inyl Chloride	<6.0 <6.0	ug/Kg ug/Kg			
a-Xylene	<6.0	ug/Kg			
o-Xytene	<b>₹6.0</b>	ug/Kg ug/Kg			
o-Xylene	<b>√6.</b> 0	ON VI			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-336-I113

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S		***********		******	
Acetone	<5.0	ug/Kg	09/29/1992	dry	
Benzene	<5.0	ug/Kg		,	
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chilorobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg			
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	<5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichtoropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg			
Methyl <del>e</del> ne Chloride	<5.0	ug/Kg			
Styrene	⋖5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1,2-Trichloroethane	<5.0	ug/Kg			
Trichioroethene	<5.0	ug/Kg			
Trichlorofluoromethane	<5.0	ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
a-Xylene	<5.0	ug/Kg			
p-Xylene	<5.0	ug/Kg			



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-358-FBI

			Analysis	
ameter	Result	Units	Date	Analyst
olatiles by GC/MS 624 AQ				
one	<5.0	ug/L	09/29/1992	cdt
ene	<5.0	ug/L	0,, 0,, 1,, 1,,	
nodichloromethane	<5.0	ug/L		•
oform	<5.0	ug/L		
omethane	<5.0	ug/L		
anone (MEK)	<5.0	ug/L		
on Disulfide	<5.0	ug/L		
on Tetrachloride	<5.0	ug/L		
robenzene	<5.0	ug/L		
roethane	<5.0	ug/L		
oroethylvinyl ether	<5.0	ug/L		
oform	<5.0	ug/L		
romethane	<5.0	ug/L		
omoch loromethane	<5.0	ug/L		
ichlorobenzene	<5.0	ug/L		
ichlorobenzene	<5.0	ug/L		
Dichlorobenzene	<5.0	ug/L		
ichloroethane	<5.0	ug/L		
ichloroethane	<5.0	ug/L		
ichloroethene	<5.0	ug/L		
-1,2-Dichloroethene	<5.0	ug/L		
ichloropropane	<5.0	ug/L	•	
,3-Dichloropropene	<5.0	ug/L		
-1,3-Dichloropropene	<5.0	ug/L		
benzene	<5.0	ug/L		
anone	<5.0	ug/t		
hyi-2-pentanone (MIBK	<5.0	ug/L		
lene Chloride	<5.0	ug/L		
ene	<5.0	ug/L		
,2-Tetrachloroethane	<5.0	ug/L		
schloroethene	<5.0	ug/L		
ene	<5.0	ug/L		
-Trichloroethane	<5.0	ug/L		
2-Trichloroethane	<5.0	ug/L		
loroe thene	<5.0	ug/L		
lorofluoromethane	<5.0	ug/L		
l Acetate	<5.0	ug/L ug/L		
l Chloride	<5.0	-		
lene	<5.0	ug/L ug/L		
lene	<5.0 <5.0			
C1 76	<b>~</b> 3.0	ug/L		



Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-360-\$146

•			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/29/1992	dry
Benzene	<5.0	ug/Kg		•
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
) i bromoch to rome than e	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
.1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
thylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg	•	
-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
To Luene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
richloroethene	< <b>5.0</b>	ug/Kg		
richlorofluoromethane	<5.0	ug/Kg		
/inyl Acetate	<5.0	ug/Kg ug/Kg		
/inyl Chloride	<5.0	ug/Kg ug/Kg		
a-Xylene	<5.0	ug/kg ug/Kg		
o-Xylene	<5.0	• •		
o-Xylene		ug/Kg		
J-Ay Lefte	<5.0	ug/Kg		



### **NET Cambridge Division**

### **QUALITY CONTROL DATA**

Client: ICF Kaiser Engineers

MET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Report Date: 09/30/1992

### Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

\$\$1 \$\$2 \$\$3 \$\$4 \$\$5 \$\$6 \$\$7 \$\$8 \$\$9 \$\$10 \$\$11 \$\$12

Bromoft 1,2-Dic Toluene Bromoft 1,2-Dic Toluene

						Perce	nt Reco	very						
Sample ID	NET I	D Matrix	SS1	SS2	\$83	\$\$4	\$\$5	\$\$6	\$\$7	888	SSS	<b>S</b> S10	SS11	SS12
cv-92-350-s79	67046	SOIL				87	83	107						
cv-92-354-\$152	67047	SOIL				80	76	117						
cv-92-340-W45	67048	SOIL				95	88	112						
CV-92-342-W51	67049	SOIL				87	.84	128						
CV-92-344-W56	67050	SOIL		."		75	76	109						
CV-92-346-W60	67051	SOIL				78	74	107						
CV-92-347-H60A	67052	SOIL				94	91	126						
CV-92-351-FBW	67053	BLANK	104	99	106									
cv-92-330-134	67138	SOIL				87	84	107						
cv-92-332-136	67139	SOIL				81	83	109						
CV-92-334-156	67140	SOIL				82	82	105						
CV-92-336-1113	67141	SOIL				85	78	104						
CV-92-358-FBI	67142	BLANK	101	100	106									
cv-92-360-\$146	67143	SOIL				87	82	102						

Notes:

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard. Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:

Decachl = Decachlorobiphenyl

Dibutyl = Dibutylchlorendate

Tetrach = Tetrachloro-m-xylene

2,4,6-T = 2,4,6-Tribromophenel

Volatile Surrogate Standards:

Bromofl = Bromofluorobenzene

1,2-Dichl = 1,2-Dichloroethane-d4

Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl \* 1,2-Dichlorobenzene-d4

Semivolatlile Surrogate Standards:

2-Fluor (1st) = 2-Fluorobiphenyl 2-Fluor (2nd) = 2-Fluorophenol Phenol- = Phenol-d6 Nitrobe = Nitrobenzene-d5

p-Terph = p-Terphenyl

Herbicides Surrogate Standard:

2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:

2-Fluor = 2-Fluorobiphenyl

para-Te = para-Terphynyl

## NET ATLANTIC INC CAMERIDGE DIVISION DATA WORKSHEET METHOD BLANK

TEST COMPOUND NAME UG/L QG/KG UG/L L  56644 CHLOROMETHANE ND 5  56628 BROMOMETHANE 5  56682 UINYL CHLORIDE 5  56638 CHLOROETHANE 5  56638 TRICHLOROFLUGROMETHANE 5  56672 METHYLENE CHLORIDE 5	MATRIX: S	OIL AQUEDUS		
SE628   BROMOMETHANE   SE6582   UINYL CHLORIDE   SE6586   O'HLORGETHANE   SE6586   TRICHLOROFLUGROMETHANE   SE6586   TRICHLOROFLUGROMETHANE   SE6582   METHYLENE CHLORIDE   SE6582   CARBON DISULFIDE   SE6582   CARBON DISULFIDE   SE6582   T.   -DICHLOROETHANE   SE6586   T.   -DICHLOROETHANE   SE6586   T.   -DICHLOROETHENE   SE6586   T.   -DICHLOROETHENE   SE6584   T.   -DICHLOROETHENE   SE6584   T.   -DICHLOROETHANE   SE6584   T.   -DICHLOROETHANE   SE6584   T.   -DICHLOROETHANE   SE6584   T.   -DICHLOROETHANE   SE6584   T.   -TEICHLOROETHANE   SE6582   T.   TETRCHLOROETHANE   SE6584   T.   -DICHLOROETHANE   SE6584   DIROMOTHANE   SE6586   T.   TETRCHLOROETHANE   SE6586   SETHYLBENZENE   SE6586   SE5586   T.   TETRCHLOROERIZENE   SE6586   T.   TE	TEST	COMPOUND NAME	RESULT UG/L UG/KG	NEPORTING LIMIT
55628         BROWNMETHANE         5           56636         CHLOROETHANE         5           56636         CHLOROETHANE         5           56636         CHLOROETHANE         5           56672         METHYLENE CHLORIDE         5           56672         METHYLENE CHLORIDE         5           56652         CARBON DISULFIDE         5           56652         CARBON DISULFIDE         5           56652         CARBON DISULFIDE         5           56652         1,1-DICHLOROETHANE         5           56658         1,2-DICHLOROETHANE         5           56654         1,2-DICHLOROETHANE         5           56654         1,2-DICHLOROETHANE         5           56630         2-BUTANONE (MEK)         5           56634         1,1-TRICHLOROETHANE         5           56632         2-BUTANONE (MEK)         5           56634         CARSON TETRACHLORIDE         5           56634         CARSON TETRACHLORIDE         5           56634         BONDOICHLOROMETHANE         5           56624         BROMODICHLOROMETHANE         5           56626         TETRACHLOROETHANE         5           56626	56644	CHLOROMETHANE	AJ	
56536         CHLOROETHANE         5           56589         TRICHLOROFLUGROMETHANE         5           56572         METHYLENE CHLORIDE         5           56520         ACETONE         5           56521         ACETONE         5           56522         CARBON DISULFIDE         5           56532         CARBON DISULFIDE         5           56520         1,1-DICHLOROETHANE         5           56542         CHLOROFORM         5           56542         CHLOROFORM         5           56543         1,2-DICHLOROETHANE         5           56544         1,2-DICHLOROETHANE         5           56552         1,1,1-TRICHLOROETHANE         5           56563         2-BUTANONE (MEK)         5           56543         CARBON TETRACHLORIDE         5           565644         CARBON TETRACHLORIDE         5           565652         1,1,1-TRICHLOROETHANE         5           56664         DIBROMOCHLOROMETHANE         5           56664         1,2-DICHLOROFROPANE         5           56664         1,1-TRICHLOROETHANE         5           56664         1,1-TRICHLOROETHANE         5           56664	56628	BROMOMETHANE	(*,	, 5
SEBSS	56692	VINYL CHLORIDE		
56672         METHYLENE CHLORIDE         S           56820         ACETONE         S           58632         CARBON DISULFIDE         S           58632         1,1-DICHLOROETHANE         S           58658         1,1-DICHLOROETHENE         S           56658         trans-1,2-DICHLOROETHENE         S           56658         trans-1,2-DICHLOROETHENE         S           56654         CHLOROFORM         S           56654         1,2-DICHLOROETHANE         S           56654         1,1,1-TRICHLOROETHANE         S           56652         1,1,1-TRICHLOROETHANE         S           56652         1,1,1-TRICHLOROETHANE         S           56652         UINYL ACETATE         S           56652         BROMODICHLOROMETHANE         S           56652         BROMODICHLOROMETHANE         S           56652         BENZENE         S           56654         DIBROMOCHLOROMETHANE         S           56654         1,1,2-TRICHLOROFROPENE         S           56654         1,1,2-TRICHLOROFROPENE         S           56654         1,1,2-TRICHLOROFROPENE         S           56654         1,1,2-TRICHLOROFROPENE         S	56638	CHLOROETHANE		
55620         ACETONE         5           56632         CARBON DISULFIDE         5           56652         1,1-DICHLOROETHANE         5           56656         1,1-DICHLOROETHENE         5           56658         trans-1,2-DICHLOROETHENE         5           56658         trans-1,2-DICHLOROETHENE         5           56642         CHLOROFORM         5           56634         CHLOROETHANE         5           56630         2-BUTANONE (MEK)         5           56634         CARGON TETRACHLORIDE         5           56636         2-BUTANONE (MEK)         5           56634         CARGON TETRACHLORIDE         5           56635         CARGON TETRACHLORIDE         5           56636         CARGON TETRACHLOROETHANE         5           56624         BROMODICHLOROMETHANE         5           56626         TICHLOROETHANE         5           56620         TICHLOROETHANE         5           56624         DIBROMOCHLOROETHANE         5           56622         BENZENE         5           56622         BENZENE         5           56634         TCANCHOROETHYLURYL ETHER         5           56678	55689	TRICHLOROFLUGROMETHANE		5
58632         CARBON DISULFIDE         5           58652         1,1-DICHLOROETHANE         5           58658         1,1-DICHLOROETHENE         5           56658         trans-1,2-DICHLOROETHENE         5           56642         CHLOROFORM         5           58654         1,2-DICHLOROETHANE         5           58654         CHURRORETHANE         5           58652         1,1,1-TRICHLOROETHANE         5           58654         CAREON TETRACHLORIUE         5           58654         CAREON TETRACHLOROMETHANE         5           56624         BRONDOICHLOROMETHANE         5           56664         DIBROMOCHLOROMETHANE         5           56664         DIBROMOCHLOROMETHANE         5           56664         T. 1,2-TETRACHLOROFEDENE         5           56664         T. 2-DICHLOROFEDENE         5           56666         TETRACHLOROFETHANE <t< td=""><td>56572</td><td>METHYLENE CHLORIDE</td><td></td><td>5</td></t<>	56572	METHYLENE CHLORIDE		5
58632         CARBON DISULFIDE         5           58652         1,1-DICHLOROETHANE         5           58658         1,1-DICHLOROETHENE         5           56658         trans-1,2-DICHLOROETHENE         5           56642         CHLOROFORM         5           58654         1,2-DICHLOROETHANE         5           56630         2-BUTANONE (MEK)         5           56631         1,1-TRICHLOROETHANE         5           56632         1,1,1-TRICHLOROETHANE         5           56634         CARBON TETRACHLORIUE         5           56634         CARBON TETRACHLORIUE         5           56634         CARBON TETRACHLORIUE         5           56634         CARBON TETRACHLORIUE         5           56636         TRICHLOROETHANE         5           56624         BROMODICHLORORETHANE         5           56646         DIBROMOCHLOROMETHANE         5           56622         BENZENE         5           56622         BENZENE         5           56644         1,1,2-TRICHLOROETHANE         5           56654         1,3-DICHLOROFROPENE         5           566526         BROMOFORM         5           56654	56620	ACETONE .		5 ********
SESSE	56632	CARBON DISULFIDE		
See	56652	1,1-DICHLOROETHANE		
See	56656	-		5
Cis-1,2-DICHLOROETHENE   5			l	
58642         CHLOROFORM         5           58654         1,2-DICHLOROETHANE         5           56630         2-BUTANONE (MEK)         5           56630         1,1-TRICHLOROETHANE         5           56634         CARBON TETRACHLORIUE         5           56634         CARBON TETRACHLORIUE         5           56590         VINYL ACETATE         5           56592         BROMODICHLOROMETHANE         5           56560         1,2-DICHLOROFROPANE         5           56560         1,2-DICHLOROETHANE         5           56564         DIBROMOCHLOROMETHANE         5           56564         1,1,2-TRICHLOROETHANE         5           56522         BENZENE         5           56640         2-CHLOROETHYLUNYL ETHER         5           56622         BENZENE         5           56640         2-CHLOROETHYLUNYL ETHER         5           56652         BROMOFORM         5           56652         BROMOFORM         5           56652         BROMOFORM         5           56652         THEXANONE         5           56656         THEXANONE         5           56650         THUBLER         <				
SBES4       1,2-DICHLOROETHANE       S         55630       2-BUTANONE (MEK)       S         55630       2-BUTANONE (MEK)       S         556520       1,1,1-TRICHLOROETHANE       S         56634       CARBON TETRACHLORIDE       S         565890       VINYL ACETATE       S         56624       BROMODICHLOROMETHANE       S         56620       1,2-DICHLOROFROPANE       S         56646       DIBROMOCHLOROMETHANE       S         56646       DIBROMOCHLOROMETHANE       S         56620       BENZENE       S         56621       BENZENE       S         56622       BENZENE       S         56644       trans-1,3-DICHLOROPROPENE       S         56625       BROMOFORM       S         56626       BROMOFORM       S         56626       BROMOFORM       S         56636       CHEXANONE       S         56636       TOLUENE       S         56636       CHLOFOBENZENE       S         56636       CHLOFOBENZENE       S         56636       CHLOFOBENZENE       S         56636       M-XYLENE       S         56636	58642			
Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   Second   S				
55682       1,1,1-TRICHLOROETHANE       5         56834       CARBON TETRACHLORIDE       5         56830       VINYL ACETATE       5         56824       BROMODICHLOROMETHANE       5         56860       1,2-DICHLOROFROPANE       5         56866       TFICHLOROETHANE       5         56648       DIBROMOCHLOROETHANE       5         56622       BENZENE       5         56644       1,1,2-TRICHLOROFROPENE       5         56625       BENZENE       5         56640       2-CHLOROETHYLVINYL ETHER       5         56626       BROMOFDORM       5         56626       BROMOFDORM       5         56626       BROMOFDORM       5         56626       TETRACHLOROETHENE       5         56636       TETRACHLOROETHENE       5         56636       TOLUENE       5         56636       CHLOPOBENZENE       5         56636       ETHYLBENZENE       5         56636       ETHYLBENZENE       5         56636       TOLUENE       5         56637       P-XYLENE       5         56638       O-XYLENE       5         56639       <		•		
56634       CARBON TETRACHLORIDE       5         56690       VINYL ACETATE       5         56624       BROMODICHLOROMETHANE       5         56660       1,2-DICHLOROFROPANE       5         56666       TRICHLOROETHANE       5         56640       DIBROMOCHLOROMETHANE       5         56621       BENZENE       5         56622       BENZENE       5         56623       BENZENE       5         56644       trans-1,3-DICHLOROPROPENE       5         56625       BROMOFORM       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56636       I-METHYL-2-PENTANONE       5         56636       I-MEXANONE       5         56636       I-MEXANONE       5         56636       I.1,2,2-TETRACHLORGETHANE       5         56636       I.1,2,2-TETRACHLORGETHANE       5         56636       GHLOFOBENZENE       5         56636       GHLOFOBENZENE       5         56636       GHLOFOBENZENE       5         56637       P-XYLENE       5         56639       P-XYLENE       5         56630				
55690       VINYL ACETATE       5         56624       BROMODICHLOROMETHANE       5         56680       1,2-DICHLOROFROPANE       5         56686       TFICHLOROETHANE       5         56686       DIBROMOCHLOROMETHANE       5         56684       1,1,2-TRICHLOROETHANE       5         56622       BENZENE       5         56684       tcans-1,3-DICHLOROPROPENE       5         56684       tcans-1,3-DICHLOROPROPENE       5         56826       BROMOFORM       5         56827       TETRACHLOFOETHANE       5         56836       TOLUENE       5         56836       TOLUENE       5         56836       CHLOFOBENZENE       5         56837       TYRENE       5         56838       TYLENE       5         56839       TYLENE       5         56830       TOLULOROBENZENE       5         56850       1,3-DICHLOROBENZENE				<u> </u>
56624       BROMODICHLOROMETHANE       5         56660       1,2-DICHLOROFROPANE       5         56686       TRICHLOROETHANE       5         56648       DIBROMOCHLOROMETHANE       5         56640       1,1,2-TRICHLOROETHANE       5         56622       BENZENE       5         56664       trans-1,3-DICHLOROPROPENE       5         56664       2-CHLOROETHYLUINYL ETHER       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56630       A-METHYL-2-PENTANONE       5         56630       TETRACHLORGETHENE       5         56636       TETRACHLORGETHANE       5         56636       TOLUENE       5         56636       CHLOPOBENZENE       5         56636       CHLOPOBENZENE       5         56694       M-XYLENE       5         56695       P-XYLENE       5         56697       P-XYLENE       5         56696       1,2-DICHLOROBENZENE       5         56696       1,3-DICHLOROBENZENE       5				
56660       1,2-DICHLGROPROPANE       5         56666       TRICHLGROETHENE       5         5664B       DIBROMOCHLOROMETHANE       5         5664B       1,1,2-TRICHLOROFTHANE       5         56622       BENZENE       5         56664       thans-1,3-DICHLOROPROPENE       5         56664       thans-1,3-DICHLOROPROPENE       5         56840       2-CHLOROETHYLVINYL ETHER       5         56826       BROMOFORM       5         56826       BROMOFORM       5         56826       BROMOFORM       5         56826       TAMETHYL-2-PENTANONE       5         56860       THETRACHLOROETHENE       5         56676       TIL,2,2-TETRACHLOROETHANE       5         56636       CHLOFOEENZENE       5         56636       CHLOFOEENZENE       5         56656       TYRENE       5         56654       M-XYLENE       5         56696       O-XYLENE       5         56697       P-XYLENE       5         56698       1,2-DICHLOROBENZENE       5         56699       1,3-DICHLOROBENZENE       5				
56666       TRICHLOROETHENE       5         56648       DIBROMOCHLOROMETHANE       5         56684       1,1,2-TRICHLOROETHANE       5         56622       BENZENE       5         56664       thans-1,3-DICHLOROPROPENE       5         56664       thans-1,3-DICHLOROPROPENE       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56626       CHEXANONE       5         56636       TETRACHLORGETHENE       5         56676       1,1,2,2-TETRACHLOROETHANE       5         56636       CHLOFOBENZENE       5         56636       CHLOFOBENZENE       5         56636       CHLOFOBENZENE       5         56637       p-XYLENE       5         56639       p-XYLENE       5         56630       1,2-DICHLOROBENZENE       5         56630       1,3-DICHLOROBENZENE       5				
5664B         DIBROMOCHLOROMETHANS         5           56684         1,1,2-TRICHLOROETHANS         5           56622         BENZENE         5           56684         thans-1,3-DICHLOROPROPENS         5           cis-1,3-DICHLOROPROPENS         5           58840         2-CHLOROSTHYLUINYL ETHER         5           56826         BROMOFORM         5           58870         4-METHYL-2-PENTANONS         5           58670         4-METHYL-2-PENTANONS         5           58678         TETRACHLOROSTHENS         5           58679         TETRACHLOROSTHANS         5           58670         TOLUENS         5           58680         TOLUENS         5           58690         CHLOROSENZENS         5           58694         M-XYLENS         5           58695         TOTAL XYLENS         5           58590         1,2-DICHLOROSENZENS         5           58590         1,3-DICHLOROSENZENS         5		•		
56684       1,1,2-TRICHLORGETHANE       5         56622       BENZENE       5         56664       trans-1,3-DICHLOROPROPENE       5         56664       2-CHLORGETHYLUINYL ETHER       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56670       4-METHYL-2-PENTANONE       5         56680       2-HEXANONE       5         56678       TETRACHLORGETHENE       5         56676       1,1,2,2-TETRACHLORGETHANE       5         56680       TOLUENE       5         56636       CHLOPOBENZENE       5         56656       ETHYLBENZENE       5         56694       m-XYLENE       5         56695       o-XYLENE       5         56696       1,2-DICHLOROBENZENE       5         56596       1,3-DICHLOROBENZENE       5				
56522       BÉNZENE       5         58664       trans-1,3-DICHLOROPROPENE       5         56526       2-CHLORGETHYLUINYL ETHER       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56626       BROMOFORM       5         56626       DHETHYL-2-PENTANONE       5         56636       THEXANONE       5         56678       TETRACHLORGETHENE       5         56670       TOLUENE       5         56630       TOLUENE       5         56636       CHLOFOBENZENE       5         56636       ETHYLBENZENE       5         56674       STYRENE       5         56694       m-XYLENE       5         56697       p-XYLENE       5         56698       0-XYLENE       5         56699       p-XYLENE       5         56690       1,2-DICHLOROBENZENE       5         56590       1,3-DICHLOROBENZENE       5				
55664       trans-1,3-DICHLOROPROPENE       5         55840       2-CHLOROETHYLVINYL ETHER       5         55826       BROMOFORM       5         56870       4-METHYL-2-PENTANONE       5         58668       2-HEXANONE       5         58678       TETRACHLORGETHENE       5         58676       1,1,2,2-TETRACHLORGETHANE       5         58680       TOLUENE       5         56630       CHLOROBENZENE       5         56636       ETHYLBENZENE       5         56694       M-XYLENE       5         56695       O-XYLENE       5         56697       p-XYLENE       5         56698       1,2-DICHLOROBENZENE       5         56590       1,3-DICHLOROBENZENE       5				
216-1,3-DICHLOROPROPENE   5				
56540       2-CHLORGETHYLUINYL ETHER       5         56526       BROMOFORM       5         56570       4-METHYL-2-PENTANONE       5         56680       1-MEXANONE       5         56670       TETRACHLORGETHENE       5         56670       1,1,2,2-TETRACHLORGETHANE       5         56630       TOLUENE       5         56630       CHLORGENZENE       5         56630       CHLORGENZENE       5         56630       ETHYLBENZENE       5         56634       M-XYLENE       5         56694       M-XYLENE       5         56697       p-XYLENE       5         56697       p-XYLENE       5         56698       1,2-DICHLORGENZENE       5         56590       1,3-DICHLORGENZENE       5	55554	-		
56826       BROMOFORM       5         56870       4-METHYL-2-PENTANONE       5         58680       2-MEXANONE       5         58678       TETRACHLORGETHENE       5         56676       1,1,2,2-TETRACHLORGETHANE       5         56680       TOLUENE       5         56630       CHLOROBENZENE       5         56566       ETHYLBENZENE       5         56674       STYRENE       5         56694       M-XYLENE       5         56695       O-XYLENE       5         56697       p-XYLENE       5         56697       p-XYLENE       5         56698       1,2-DICHLOROBENZENE       5         56590       1,3-DICHLOROBENZENE       5	55545	•		
56570       4-METHYL-2-PENTANONE       5         56668       2-HEXANONE       5         56678       TETRACHLORGETHENE       5         56676       1,1,2,2-TETRACHLORGETHANE       5         56680       TOLUENE       5         56630       CHLORGENZENE       5         56636       ETHYLBENZENE       5         56674       STYRENE       5         56694       M-XYLENE       5         56695       o-XYLENE       5         56687       p-XYLENE       5         56687       p-XYLENE       5         56687       1,2-DICHLORGBENZENE       5         56560       1,3-DICHLORGBENZENE       5		•	, , , , , .	
56668       I - HEXANONE       5         56678       TETRACHLORGETHENE       5         56676       1,1,2,2-TETRACHLORGETHANE       5         56680       TOLUENE       5         56636       CHLOROBENZENE       5         56636       ETHYLBENZENE       5         56674       STYRENE       5         56694       M-XYLENE       5         56695       O-XYLENE       5         56697       p-XYLENE       5         56697       TOTAL XYLENES       5         56697       1,2-DICHLOROBENZENE       5         56596       1,3-DICHLOROBENZENE       5				
56678       TETRACHLORGETHENE       5         56676       1,1,2,2-TETRACHLORGETHANE       5         56680       TOLUENE       5         56636       CHLOROBENZENE       5         56636       ETHYLBENZENE       5         56674       STYRENE       5         56694       m-XYLENE       5         56695       o-XYLENE       5         56697       p-XYLENE       5         56697       p-XYLENE       5         TOTAL XYLENES       5         56549       1,2-DICHLOROBENZENE       5         56550       1,3-DICHLOROBENZENE       5				
58676       1,1,2,2-TETRACHLORGETHANE       5         58680       TOLUENE       5         56638       CHLOPOBENZENE       5         56666       ETHYLBENZENE       5         56674       STYRENE       5         56694       m-XYLENE       5         56695       o-XYLENE       5         56697       p-XYLENE       5         56697       p-XYLENE       5         56698       1,2-DICHLOROBENZENE       5         56549       1,3-DICHLOROBENZENE       5				II.
56680       TOLUENE       5         56636       CHLOPOBENZENE       5         56686       ETHYLBENZENE       5         56674       STYRENE       5         56694       m-XYLENE       5         56695       o-XYLENE       5         56697       p-XYLENE       5         TO1AL XYLENES       5         58649       1,2-DICHLOROBENZENE       5         58560       1,3-DICHLOROBENZENE       5	56678			
56636       CHLOPOBENZENE       5         56666       ETHYLBENZENE       5         56674       STYRENE       5         56684       m-XYLENE       5         56696       o-XYLENE       5         56687       p-XYLENE       5         TOTAL XYLENES       5         58648       1,2-DICHLOROBENZENE       5         58550       1,3-DICHLOROBENZENE       5		1,1,2,2-TETRACHLORGETHANE		
56666       ETHYLBENZENE       5         56674       STYRENE       5         56694       m-XYLENE       5         56695       o-XYLENE       5         56697       p-XYLENE       5         TOTAL XYLENES       5         58549       1,2-DICHLOROBENZENE       5         58550       1,3-DICHLOROBENZENE       5				
56674       STYRENE       5         56694       m-XYLENE       5         56695       o-XYLENE       5         56697       p-XYLENE       5         TOTAL XYLENES       5         56549       1,2-DICHLOROBENZENE       5         56550       1,3-DICHLOROBENZENE       5	56636	CHLOPOBENZENE		
56694       m-XYLENE       S         56696       o-XYLENE       S         56697       p-XYLENE       S         T01AL XYLENES       S         56698       1,2-DICHLOROBENZENE       S         56699       1,3-DICHLOROBENZENE       S	56566	ETHYLBENZENE		5
56696       o-kylene        5         56697       p-Xylene        5         T01AL XYLENES        5         56549       1,2-DICHLOROBENZENE        5         58550       1,3-DICHLOROBENZENE        5	56674	STYRENE		5
56697       p-XYLENE       5         T01AL XYLENES       5         56549       1,2-DICHLOROBENZENE       5         56550       1,3-DICHLOROBENZENE       5	56694	m-XiLENË		5
TOTAL XYLENES 5 55549 1,2-DICHLOROBENZENE 5 56550 1,3-DICHLOROBENZENE 5	56696	O-XYLENE	*****	5
50548       1,2-DICHLOROBENZENE       5         56550       1,3-DICHLOROBENZENE       5	56697	p-XYLENE		5
50548       1,2-DICHLOROBENZENE       5         56550       1,3-DICHLOROBENZENE       5		TOTAL XYLENES		
56550 1,3-DICHLOROBENZENE 5	SE548			
SUPROGATE COMPOUND RECOVERIES % SOIL LIMITS AQUEOUS 551 D4-DICHLOROETHANE 80 70-121% 76-11				



## NET ATLANTIC, INC CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME:928925 18:23 ANALYST: MANAGER INSTRUMENT: HP5970 . BLANK FILE: >H4120 MATRIX: SOIL AQUEOUS MEDIUM LEVEL RESULT REPORTING LIMIT TEST COMPOUND NAME U6/L 067K6 U6/L U6/K6 5 55544 CHLOROMETHANE ND 56628 BROMOMETHANE 5 5 56692 VINYL CHLORIDE CHLORDETHANE 5 26538 55668 TRICHLOROFLUOROMETHANE 5 58672 METHYLENE CHLORIDE 5 ACETONE 5 58620 5 56652 CARBON DISULFIDE 56652 1,1-DICHLORDETHANE 5 56856 1.1-DICHLORDETHENE 5 56656 trans-1.2-DICHLOROETHENE 5 5 dis-1,2-DICHLOROETHENE 55642 CHLOROFORM 5 56654 1.2-DICHLORDETHANE 5 2-BUTANONE (MEK) 56530 5 56662 1,1,1-TRICHLORDETHANE 5 56654 CARBON TETRACHLORIDE 5 56690 VINYL ACETATE 5 BROMODICHLOROMETHANE 56624 56668 1,2-DICHLOROFROFANE 56666 TRICHLOROETHENE 56646 DIBROMOCHLOROMETHANE 5 1,1,2-TRICHLORGETHANE 58664 58622 BENZENE 5 trans-1.3-DICHLOROFROPENE 56654 5 cis-1.3-D10HL0R0PR0PENE 5 56640 2-CHLORDETHYLVINYL ETHER 56626 BROMOFORM 5 4-METHYL-2-PENTANONE 56676 5 56666 **2-HEXANONE** 5 55578 TETRACHLOROETHENE 5 58875 1,1,2,2-TETRACHLOROETHANE 58888 TOLUENE 5 55636 CHLOROBENZENE 56666 ETHYLBENZENE 55674 STYPENE 56694 m-XYLENE  $\overline{\phantom{a}}$ 56696 o-XYLENE 55697 p-XYLENE 5 5 TOTAL XYLENES 56648 5 1,2-DICHLOROBENZENE 58650 1,3-DICHLOROBENZENE 5 1.4-D]CHLOROBENZENE SURROBATE COMPOUND RECOVERIES SOIL LIMITS AQUEOUS LIMITS 7.

75

50

70-121%

84-136%

59-113%

75-114%

88-110%

85-115%

951 D4-DICHLORDETHANE

SS3 BROMOFLUORGEENZENE

552 D8-TOLUENE



## NET ATLANTIC, INC. CAMBRIDGE DIVISION - DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 12:32

ANALYST: JIM

INSTRUMENT: HP5970

TEST	COMPOUND NAME	RESULT UG/L UG/KG	REPORTING LIMIT
56644	CHLOROMETHANE		5
56628	BROMOMETHANE		5
56692	VINYL CHLORIDE		5
56638	CHLORGETHANE		5
56688	TRICHLOROFLUOROMETHANE		5
56672	METHYLENE CHLORIDE		5
56620	ACETONE ,		5
56632	CARBON DISULFIDE		5
56652	1,1-DICHLOROETHANE		≨ <b>5</b>
56556	1,1-DICHLORGETHENE		ື້ 5ົ
56658	trans-1,2-DICHLOROETHENE		5
	cis-1,2-DICHLOROETHENE		<b>5</b>
56642	CHLOROFORM		5
56654	1,2-DICHLORDETHANE		- 5
56630			5
56532			5
56634			5
56690			5
56624			5
5656U			5
56686			5
56646		• • • • •	Ę.
56684			5
56622	BENZERE	1	5
56664	trans-1,3-DICHLOROPROPEN	<del>*</del>	5
2000 <del>-</del>	cis-1.3-DICHLOROPROPENE	_ 4 * • • •	5
56640	2-CHLOROETHYLVINYL ETHER	*****	- 5
56406	PROMOBORN		5
აიი.ი ნრგშმ	•		
56668 -		• • • • •	<u> </u>
56678		• • • • •	5 5
Peyva Sevan			5 5
766'6 56680	1,1,2,2-TETRACHLORGETHANS	± ±	5 5
56636	TOLUENE		5 5
	CHLORIDEENZENE		_
56666	ETHYLEENZENE		5
56674	STYREGE	• • • • •	5
56694	m-XYLENE		<u> </u>
56696	o-XYLENE		<u> </u>
56697	p-XYLEHE		5 <i>i</i>
<b>.</b>	TOTAL XYLERES		5
56648	1.2-DICHLOROBENZENE		5
5665B	1,3-DICHLOROBENZENE		5
56651	1,4-D1CHLOROBENZENE		5 11
	TE COMPOUND BEIDGESIES	R COILLIMI	75 0005005 1

SUBROGATE COMPOUND RECOVERIES SOIL LIMITS AQUEOUS L S 96 76-11-% وو 431 04-010460RDETHAME 70-121% . SET DR-TOLUENE 104 84-138% 88-116% RES PROMINELLIGEORENZEME 59-113% 86-115% 101

## NET ATLANTIC, INC. CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME: 920929 16:46

SS: D4-DICHLOROETHANE

553 BROMOFLUOROBENZENE

SS2 D8-TOLUENE

ANALYST: JIM

INSTRUMENT: HP5970

BLANK FILE: >E0181
MATRIX: SDIL \_\_\_\_\_ AQUEDUS \_\_\_\_ MEDIUM LEVEL \_\_\_\_\_

TEST	COMPOUND NAME	UG/L UG/KG	REPORTING LIMIT UG/L UG/KG
<del>5</del> 6644	CHLOROMETHANE	NP	5
56628	BROMOMETHANE		. 5
56592	VINYL CHLORIDE		5
56638	CHLOROETHANE		5
56688	TRICHLOROFLUOROMETHANE		5
56672	METHYLENE CHLORIDE		5
56620	ACETONE		5
56532	CARBON DISULFIDE		5
56652	1,1-DICHLOROETHANE		5 :
56656	1,1-DICHLOROETHENE		5
56558	trans-1,2-DICHLOROETHENE		<b>5</b> 4 2 3 3 5 5 5
	cis-1,2-DICHLOROETHENE	1	5
56642	CHLOROFORM		5
58554	1,2-DICHLOROETHANE		5
56630	2-BUTANONE (MEK)		5
56682	1,1.1-TRICHLORGETHANE	}	5
56634	CARBON TETRACHLORIDE		5
56590	VINY: ACETATE		5
56624	BROMODICHLOROMETHANE		5
56660	1.2-DICHLOROPROPANE		5
55585	TRICHLOROETHENE		5
55646	DIEROMOCHLOROMETHANE	,	5
56534	1,1,2-TRICHLOROETHANE	• • • • • • • • • • • • • • • • • • • •	5
56522	BENZENE	• • • • • • • • • • • • • • • • • • • •	5 5
56554	trans=1,3-DICHLOROPROPENE	*****	5
56884	cis-1,3-DICHLOROPROPENE		2
56640	2-CHLOROETHYLVINYL ETHER		5
56826	BROMOFORM	• • • • • • • • • • • • • • • • • • • •	5
56670	4-METHYL-2-FENTANONE		5
55558	2-HEXANONE		ລ 5
	<del>.</del>	• • • • •	5
56578 56576	TETRACHLORDETHENE 1,1,2,2-TETRACHLORDETHANE	-	5 5
			5 5
56630	TOLUZNE	* * * * * 1	5
56636	CHLOPOBENZENE	••••	
56666	ETHYLBENZENE		5
56E74	STYRENE	• • • • •	5
55694	m-YYLENE	• • • • •	5
56696	o-XYLENE	• • • • •	5
56697	p-XYLENE	• • • • • • • •	5
EEE 45	TOTAL XYLENES	* * * * * *	5
56646	1,2-DICHLOROBENZENE		5
56650	1,3-DICHLOROBENZENE		5
56651	1,4-BICHLORGBENZENE	🖤	5

99

102

97

70-121%

84-138%

59-113%

75-114%

88-110%

86-115%



56644 56628 56682 56638 56668 56672 56620	CHLOROMETHANE BROMOMETHANE VINYL CHLORIDE CHLOROETHANE TRICHLOROFLUOROMETHANE		· ND	5
5628 56692 56638 5668 56672	BROMOMETHANE VINYL CHLORIDE CHLOROETHANE		יא יי	
56692 56638 5668 56672	VINYL CHLORIDE CHLOROETHANE			5
66538 6668 66672	CHLOROETHANE			5
6668 6672				5
6672				5
	METHYLENE CHLORIDE		. 1	5
	ACETONE			5
6632	CARBON DISULFIDE			5
56652	1.1-DICHLOROETHANE			5
6656	1.1-DICHLOROETHENE		:	5
56658	trans-1,2-DICHLOROETHENE		· ·	5
	cis-1,2-D1CHLOROETHENE		1	
56642	CHLOROFORM			. <mark>5</mark> S
5554	1,2-DICHLOROETHANE			5
55530	2-BUTANONE (MEK)			5
56682	1,1,1-TRICHLDROETHANE			5
56534	CARBON TETRACHLORIDE			5
56898	VINYL ACETATE		]	5
55624	BROMODICHLOROMETHANE			5
56550	1,2-D1CHLOROPROPANE		]	5
55686	TRICHLORGETHENE			5
56646	DIBROMOCHLOROMETHANE			5
55554	1,1,2-TRICHLORGETHANE			5
56522	BENZENE			5
35554	trans-1,3-DICHLORUPROFENE			5
	cis-1,3-DICHLOROPROPENE			5
55640	2-CHLOROETHYLVINYL ETHER			5
36626	BROMOFORM			5
56676	4-METHYL-2-PENTANONE			5
58658	2-HEXANONE			5
55578	TETRACHLOROETHENE			5
35676	1,1,2,2-TETRACHLOPGETHANE			5
56638	TOLUENE			5
56636	CHLOROBENZENE			5
56666	ETHYLBENZENE			5
55674	STYRENE			5
55594	m-YYCENE			5
56896	o-XYLENE			5
56697	p-XYLENE			5
	TOTAL XYLENES			5
56546	1.2-DICHLORGBENZENE			5
55550	1,3-DICHLOROBENZENE			5
56651	1,4-DICHLOROBENZENE			5
	DICHLORGETHANE	% 81 90	SOIL LIM 70-121 84-138	75-114%

87

59-113%

86-115%

SS3 BROMOFLUOROBENZENE



## MET ATLANTIC, INC CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME: 920929 23:40

591 D4-DICHLOROETHANE

SS3 BROMOFLUOROBENZENE

SS2 D8-TOLUENE

ANALYST: JP

INSTRUMENT: HP5970

MATRIX: 9	OIL AQUEOUS	MEDIUM LEVEL	<del>_</del>
TEST	COMPOUND NAME	NESULT NEVKE	REPORTING LIMIT UG/L UG/KG
56644	CHLOROMETHANE	NT)	5
56628	BROMOMETHANE		5
566 <del>9</del> 2	VINYL CHLORIDE		5
56638	CHLORGETHANE		. 2
56688	TRICHLOROFLUOROMETHANE		5
56672	METHYLENE CHLORIDE		5
58620	ACETONE		5
55632	CARBON DISULFIDE		5
56652	1.1-DICHLOROETHANE		5
56656	1.1-DICHLOROETHENE		5
56558	trans-1,2-DICHLOROETHENE		<b>5</b> **********
	cis-1,2-DICHLORDETHENE		<b>=</b>
56642	CHLOROFORM		
55554	1,2-DICHLOROETHANE		5
58530	2-BUTANONE (MEK)		5
56662	1.1.1-TRICHLOROETHANE		5
56634	CARBON TETRACHLORIDE	••••	5
56690	VINYL ACETATE		5
56524	BROMODICHLOROMETHANE	• • • • • • • • • • • • • • • • • • • •	5 5
56660	1,2-DICHLOROPROPANE		5
56686 56686	TRICHLOROETHENE	••••	5 5
56646	DIBROMOCHLOROMETHANE		5 5
	1,1,2-TRICHLOROETHANE		5 E
56 <i>58</i> 4		• • • • •	5 5
55522	BENZENE	• • • • • •	5 5
56654	trans-1,3-DICHLOROPROFENE	1	
55548	cis-1,3-DICHLOROPROPENE		5
56540	2-CHLORGETHYLVINYL ETHER	• • • • •	5
56626	BROMOFORM		5
56E7G	4-METHYL-Z-PENTANONE		5
58888	2-HEXANONE		5
56678	TETRACHLORGETHENE		5
56676	1,1,2,2-TETRACHLOFOETHANE	• • • • • • • • • • • • • • • • • • • •	5
56580	TOLUENE	• • • • • •	5
56636	CHLOROGENZENE		5
55565	ETHYLBENZENE	•••••	5
56574	STYRENE	• • • • • •	5
56694	m-XYLENE	,	5
56698	o-XYLENE		5
56697	p-XYLENE	• • • • •	5
	TOTAL XYLENES		5
56648	1,2-DICHLOROBENZENE	• • • • • • •	5
56650	1,3-DICHLORDBENZENE		5
56651	1,4-DICHLOROBENZENE	\	5

79

54

103

70-1217

84-136%

59-113%

76-114%

88-110%

86-115%



### NET ATLANTIC, INC. CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME:920930 10:19 ANALYST: MARK INSTRUMENT: HP59 2û BLANK FIFE: >GB038 MATRIX: SOIL AQUEDUS MEDIUM LEVEL RESULT REPORTING LIMIT TEST COMPOUND NAME UG/KG UG/L UGZKG 56644 CHLOROMETHANE 56628 5 BROMOMETHANE 56692 VINYL CHLORIDE 5 56638 5 CHLORGETHAME 56688 TRICHLOROFLUGROMETHANE 5 56672 METHYLENE CHLORIDE 56620 ACETONE 56632 CARBON DISULFICE 56652 1,1-DICHLOROETHANE 56656 ₹ 5° × · · 1,1-DICHLORGETHENE 56658 5 trans-1,2-DICHLORDETHENE dis-1,2-DICHLORUETHEME 5 5 56642 CHLOROFORM 56654 1,2-Dichloroethane 56630 2-BUTANONE (MEK) 56682 1.1.1-TRICHLORDETHAME 56634 CARBON TETRACHLORIDE 56690 UINYL ACETATE 5 56624 BROMODICHLOROMETHANE Section 0 1.2-DICHLOROPPOPA4E 56686 TRICHLORDETHENE DI BROMOCHL ORDMETHANE 56646 1,1,2-TRICHLORDETHAME 54684 BENZENE 56602 56664 trans-1,3-DICHLOROPROPENE cis-1,3-D1CHLOPOPFOPENE 5 56640 2-CHLOPÖETHYLVINYL ETHER 5 56626 BROMUF ORM 5 566Z0 4-METHYL-2-PENTANONE 2-HEMAN(INE Forth St 56678 TETRACHLORGETHENE F6676 1,1,2,2-TETRACHLORGETH-WE 5668O TOLUENE è E 4-26 CHLOROBENZERIE 56666 ETHYLEENZENE 56674 STYRENE 56694 m-XTLENE 56696 o-XYLEME 5 56697 5 D~XYLENE TOTAL XYLENES 5 56648 1.2-DICHLOROBENZENE 5 며도본트 (j 5 1,3-010HL0P8854ZE3E 1,4-DICHLÖRÖBENZENE SHAROGATE COMPOUND RECOVERIES SÜLL LINITS AQUEOUS L 95 FB1 D4-EdichLOROETHAGE 20-12:% 76-11-% 97

. 100

84-139%

59-11-%

88-110%

86-115%

SEM DE-TOLLIENE

AR PROMINELLIGHNESSENDENE

## NET ATLANTIC, INC. CAMBRIDGE DIVISION DATA WORKSHEET METHOD BLANK

DATE/TIME: 920930 13:35 ANALYST: MARK -INSTRUMENT: HP59 BLANK FILE: >G8042 MATRIX: SDIL AQUEDUS MEDIUM LEVEL REPORTING LIMIT RESULT TEST COMPOUND NAME UG/L UG/KG UG/L UG/KG 56644 CHLOROMETHANE 5 ND 5 56628 BROMOMETHANE 5 56692 VINYL CHLORIDE 5 56638 CHLOROETHANE 56688 TRICHLOROFLUDROMETHANE 5 5 56672 METHYLENE CHLORIDE 56620 ACETONE 56632 CARBON DISULFIDE 5 56652 1,1-DICHLORGETHANE 5 56656 1,1-DICHLORDETHENE 56658 trans-1,2-DICHLORDETHENE 5 5 cis-1,2-DICHLOROETHENE 5 56642 CHLOROFORM 56654 5 1,2-DICHLORUETHANE 56630 2-BUTANONE (MEK) 5 1,1,1-TRICHLOROETHANE 5 56682 56634 5 CARBON TETRACHLORIDE 5 5669 O UINYL ACETATE 5 56624 BROMODICHLOROMETHANE Ę, 5666B 1,2-DICHLOROPROPANE 5 56686 TRICHLORDETHENE 56646 DIBROMOCHLOROMETHANE 5 56684 1,1,2-TRICHLOROETHANE 5 56622 BENZEHE 5 56664 trans-1,3-DICHLOROPENE cis-1,3-DICHLOROPROPENE 5 56640 2-CHLORSETHYLVINYL ETHER 56626 5 BROMOFORM 56570 4-METHYL-2-PENTANONE ნტტიც. 2-HEXAMBRE ちょってき TETRACHLORGETHENE 56676 1,1,2,2-TETRACHLORUETHANE 5 5668Û TOLUENE 566.36 CHLOROBENZENE 5 56666 ETHYLBENZENE 56674 STYREKE 56694 m-XYLENE 56696 o-XYLENE P-XYLENE 5 5669フ 5 TOTAL XYLENES 56648 5 1,2-DICHLOROBENZENE 56650 1,3-DICHLOROBENZENE 5 56651 SURROGATE COMPOUND RECOVERIES SOIL LIMITS ADUEDUS . 101 551 D4-D18HLORDETHAKE 76-1145 70 - 121%SS2 D8-TOLUENE 84-138% 88-110%

553 BROMOFLUOROBENZENE

(NO)

86-115%

### NET CAMBRIDGE

### SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

JOB NO. 92.34/12 SAMPLE NO. 67139

- FILE .			KATHER					
COMPOUNDS	ADDED	100	- '	ł	MS CONCENTRATION (UG/Kg)	1		LIMITS
,1-DIGHLOROETHENE FRICHLOROETHENE BENZENE FOLUENE CHLOROBENZENE	50 50 50	1	Ø. Ø Ø. Ø Ø. Ø Ø. Ø		39.9 38.9 44.8 47.4 42.6	}	79.81 77.81 89.61 94.81 85.21	62-13 66-14) 55-13
FILE			e e e e e e e e e e e e e e e e e e e					
		100	M5D DNCENTRATION (U6/Kg)	:	*/ /c	%	00 L   %    RFD	%
1,1-DICHLORGETHENE TRICHLOROETHENE BEN7ENE TOLUENE CHLOROBENZENE	50 : 50 : 50		41.3	}	82.5   94.5	<b>6</b> 5 8	1 22 1 1 24 1 1 21 1 1 21 1	62-13 66-14 59-13
						(%	APD FOR <= 25%	
	VALUE	.5 DI	UTSIDE OF QC	į	IMITS			
RPD:	<u> </u>	UT (	GF 5	(	DUTSIDE LIMITS	: :		
SPIKE RECOVERY	:0		007 OF	1 (	OUTSIDE	ÐΕ	LIMITS	
COMMENTS:								

3/90

### CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS

ADDRESS 4 Gateway Center Pittsburgh PA 15222 PHONE (412) 497-2385



92. 34096 92. 34098

Cambridge Division, 12 Oak Park, Bedford, MA 01730

•	•		1	•	₩
SAMPLED BY CHARLE	ES E. HAEFNER  Jos WEEKS JR Signa	Charle E Ha	gh fr		ANALYSES
(Print Name)	OS WEEKS JR Signa	Drefes !	White For		
SAMPLE DATE TIME	SAMPLE LOCATION	COMP GAMP COMP COMP COMP COMP COMP COMP COMP CO	SAMPLE PRESERVATIVE		COMMENTS
V-92-341-W45[]/23/1398 WE	ST STORAGE IND	400 G X	SOIL ICE		EPA 5W846
V-92-341-W45 1 1340	, (		ITCE	X	X Method 8240
V-92-342-W51 1050	÷	X /	上。E	X	<b>X</b>
CV-92-343-WSI 1050			ICE	X	X
(V-92-344-WSG 1219	- 4	X   /	ICE.	X	X
CV-92-345-WG 1219			すくも	X	X
V-92-34-W60 1250			TCE	<del></del>	×
V-92-347-WOA) 1310			ICE		X
V-92-348-W6 1120		X     (	ICE	X	X
V-92-349-W44, 1135		X     /	ICE	X	X
U-92-359-W60AV 1310	<u> </u>	$ \Psi \Psi\chi $ 1	₩ ICE		10 10 10 10 10 10 10 10 10 10 10 10 10 1
V-92-357-FBW 1353	<u> </u>	" " X 2	WATER ICE	X	X 4
	· · · · · · · · · · · · · · · · · · ·			)	
					Alare Con
Relinquished by Date	/ Time   Received by / \	<u> </u>	Relinquished by:	Delay Time	Redpived by:
$\sim 100$	311725	·	ב בייים ובייים אב	1/24 11:00	$A = A \cap A \cap A \cap A \cap A \cap A \cap A \cap A \cap A \cap $
	/ Time Received by:		Relinquished by:	Date / Time	Received for Laboratory by:
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Fed NEW TOSS	<b>ENOT</b> M	双门什事	wa read	A KANTER VIEW	day F Sanga Aus
	PT 1 — ORIG	NAL PT 2 NET Project N	lanager—Yellow PT 3—Cu	stomer Copy—Pink	400K /1961/00 4/20191-E

NATIONAL 92. 34098 ENVIRONMENTAL 92. 34098 TESTING, INC. 92. 34096 CHAIN OF CUSTODY RECORD PROJECT NAME PPS CIRCLEVILLE COMPANY ICF KAISER ENGINEERS ADDRESS 4 Gateway Conter Pittsburgh PA 15222 PHONE (412) 497-2385 Cambridge Division, 12 Oak Park, Bedford, MA 01730 SAMPLED BY **ANALYSES** CHARLES E. HABENER IPIA Nam DOVGLAS WEEKS TO Signatur SAMPLE SAMPLE PRESERVATIVE SAMPLE LOCATION DATE TIME COMMENTS V-92-350-579 9/23/645 CO. TH SIGRAGE IAD SUIL ICE EPA SW846 Method 8240 V-92-351-ST9 TIE ICE V-92-359-5152 1710 V-92-358-5152 4 1710 V-92-356-5100 1725 SUIL ICE SOIL G SIL TCE 7 CF Relinquished by Date / Time Received by. Relinquished by: Received by: Date / Time MARIEGE HAETNER9/23 Received by Relinquished by: PT 2 NET Project Manager—Yellow PT-3—Customer Copy—Pink

### CHAIN OF CUSTODY RECORD

NATIONAL ENVIRONMENTAL TESTING, INC.

9234113

PROJECT NAME PPG CIRCLEVILLE

COMPANY ICF KAISER ENGINEERS

ADDRESS FOUR GATEWAY CENTER PIHSburgh PA 15202 Cambridge Division, 12 Oak Park, Bedford, MA 01730 PHONE (412) 497

SAMPLED BY A. Douglas Weeks Tr 4. Do **ANALYSES** SAMPLE PRESERVATIVE SAMPLE NO. DATE TIME SAMPLE LOCATION COMMENTS V-92-330-I34 9/4/0904 Incinerator PAD EPA SN846 HOZ G X ICE 1-92-331-134 9/24 0910 Incinerator Fpad. Method 8240 1-92-332-136 9/24 0932 1-92-333-536 9/24/0940 1-92-334- IS6 9/04 0830 1-92-335- TSG 9/24/0830 17.00 1-92-326-1113 9/24 0830 1-92-357- III3 9/24 0830 1-92-338- 124 924 0955 V-92-339- I45 9124 0815 1-92-358-FBI 9124 1015 40nl G Water ILE 192-355-3146 9/24 1115 South Storage PAD 402 G X Soil TCE -92-360-5146 9/24 1120 South Storage , PAD 5011 ILE Relinquished by Date / Time Received by Relinquished by: / Date / Time Received by: HARLES E HAEFNER 11:00 1230 Relinguished by Date / Time Received by Refinguished by: Date / Time

### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Project: PPG Soil VOAs-Now RUN

10/19/1992

≰tio mwillion to

NET Job Number: 92.34098

National Environmental Testing

NET Atlantic, Inc. Cambridge Division 12 Oak Park Bedford, MA 01730

### **NET Cambridge Division**

### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Reported By:

National Environmental Testing NET Atlantic, Incorporated Cambridge Division

Cambridge Division 12 Cak Park

Bedford, MA 01730

Collected By: ICF

NET Job Number: 92.34098

Project: PPG Soil VOAs-Now RUN

Report Date: 10/19/1992

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG Soil VOAs-NOW RUN

Airbill No: 4450798273

NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler

NET Project Manager

Michael F. Delaney, Ph.D. Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE Taken	TIME TAKEN	DATE Rec'd	HATRIX	
CV-92-351-S79	67060	09/23/1992	16:45	09/24/1992	SOIL	-
CV-92-359-W60A	67068	09/23/1992	13:10	09/24/1992	SOIL	

Report Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-S79

			Analysis			
Parameter	Result	Units	Date	Analyst		
TO V 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	••••••	****				
TCL Volatiles by GC/MS 8240 S	-( 6	417	40 (0) (4000	,		
Acetone	<6.0	ug/Kg	10/06/1992	dry		
Benzene	<6.0	ug/Kg				
Bromodichloromethane	<6.0	ug/Kg			_	
Bromoform	<6.0	ug/Kg			gt Denneld.	
Bromomethane	<6.0	ug/Kg				
2-Butanone (MEK)	<6.0	ug/Kg				
Carbon Disulfide	<6.0	ug/Kg				
Carbon Tetrachloride	<6.0	ug/Kg				
Chlorobenzene	<6.0	ug/Kg				
Chloroethane	<6.0	ug/Kg				
2-Chloroethylvinyl ether	<6.0	ug/Kg	·			
Chloroform	<6.0	ug/Kg				
Chloromethane	<6.0	ug/Kg				
Dibromochloromethane	<6.0	ug/Kg				
1,2-Dichlorobenzene	<6.0	ug/Kg				
1,3-Dichlorobenzene	<6.0	ug/Kg				
1,4-Dichlorobenzene	<6.0	ug/Kg				
1,1-Dichloroethane	<6.0	ug/Kg				
1,2-Dichloroethane	<6.0	ug/Kg				
1,1-Dichloroethene	<6.0	ug/Kg				
trans-1,2-Dichloroethene	<6.0	ug/Kg				
1,2-Dichloropropane	≪6.0	ug/Kg				
cis-1,3-Dichloropropene	≪6.0	ug/Kg				
trans-1,3-Dichloropropene	<6.0	ug/Kg				
Ethylbenzene	<6.0	ug/Kg				
2-Hexanone	<6.0	ug/Kg				
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg				
Methylene Chloride	<6.0	ug/Kg				
Styrene	<6.0	ug/Kg				
1,1,2,2-Tetrachloroethane	⋖6.0	ug/Kg				
Tetrachloroethene	<6.0	ug/Kg				
Toluene	<6.0	ug/Kg				
1,1,1-Trichloroethane	<6.0	ug/Kg				
1,1,2-Trichloroethane	<6.0	ug/Kg				
Trichloroethene	<6.0	ug/Kg				
Trichlorofluoromethane	<6.0	ug/Kg				
Vinyl Acetate	<6.0	ug/Kg				
Vinyl Chloride	<6.0	ug/Kg				
m-Xylene	<6.0	ug/Kg				
o-Xylene	<6.0	ug/Kg				
p-Xylene	<6.0	ug/Kg				

Report Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-359-W60A

			Analysis		
Parameter	Result	Units	Date	Analyst	
	************				
TCL Volatiles by GC/MS 8240 S	_				
Acetone	<b>&lt;</b> 5.0	ug/Kg	10/06/1992	<b>ch</b> g	
Benzene	<5.0	ug/Kg			A Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Comp
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			A CONTRACTOR
Bromomethane	<5.0	ug/Kg			
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chlorobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg		•	
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	<5.0	ug/Kg			
1,3-Dichlorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			,
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg			
Methylene Chloride	<5.0	ug/Kg			-
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg			
Tetrachloroethene	<5.0	ug/Kg			
Toluene	<5.0	ug/Kg			
1,1,1-Trichloroethane	<5.0	ug/Kg			
1,1,2-Trichloroethane	<5.0	ug/Kg			
Trichloroethene	<5.0	ug/Kg			
Trichlorofiuoromethane	<5.0	ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0	ug/Kg			
p-Xylene	<5.0	ug/Kg			
•					

### CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS Y Garley of Center Pittsburgh PA 15222
PHONE (412) 497-2385



NATIONAL ENVIRONMENTAL / TESTING, INC. 34098

Cambridge Division, 12 Oak Park, Bedford, MA 01730

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SAMPLED BY	CHAR.	LES E. HABFI DOVGLAS WE	EXS JR Sig	gnature A	) E ,	the		() Wanh	178.			2 / S			ANALY	SES	
SAMPLE NO.	DATE TIME	SAMPLE	LOCATION	SIZE	G/Þ	COMP	NO OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	zi.			St. St.			сомы	IENTS_
19.50 5 19 19.51-5 17 193/392/39	1649	20-1115100	GE IXID	400	G G	/ /	1	SCIL	100 700 <b>Tek</b>	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\			. X		X	Methics	13240
-92-354- <b>5</b> 19 -92-354- <b>5</b> 19 1-92-365-51	2 1710	<del></del>			G >	<i>(</i>	1	SOIL SOIL	ICE ICE	4 2 X X			X		Z		
1-92-356-51				V	G)		Ĺ	SOEL	TLE	X					X		
ARCEGE. H.		L <u> </u>	Received by:	•				Relinquish		<u>_</u> 5%.	19/2	/ Time	:00		MM by	Open Sta	p scent
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FETTERAL	- Exp	re 95	@No	Mal	TA	=	Hi	old	Rend	ing	PO	rults	``		1/	Sam	
MPS	<b>F</b> [95]	EZZL AUGU	PT 1 OR	IIGINAL F	7T 2 NE	₹ Proje	ct Man	agerYello	ow PT 3—Cu	stomer C	opy—Pi	ık	) in (	thul	The	Mil	9 24/42 16

92, 34018 NATIONAL ENVIRONMENTAL TESTING, INC. CHAIN OFICUSTODY RECORD PROJECT NAME PPG CIRCLEVILLE

COMPANY ICI KAISER ENGINEERS

ADDRESS 4 GITCHEY Center Pittsburgh PA 15,202

PHONE 1412 1 1977-2385 Cambridge Division, 12 Oak Park, Bedford, MA 01730 CHARLES E. HAEFNER Charle & Harde PyA NamDouglas WEEKS JR Signature Dryles Wer SAMPLED BY ANALYSES SAMPLE NO. DATE TIME PRESERVATIVE SAMPLE LOCATION COMMENTS TR MC WHETTER 1394 WEST STORTON LAIN 400 (1) CPH 51,78416 1 < 1 Method 5240 1 12-511-1245 13.10 13. 1-92-342-651 ICE X 1050 1-92-543-451 ICE 1050 1-92-344-656 1219 TCF V-92-345-W.A 1219 TCE  $\overline{\mathsf{X}}$ 1250 -92-34-W60 TOE -92-347-WEOA 1310 ICE -92-348-WG 1120 ICE -92-349-W44 1135 TCE X -92-359-WGEAV 1310 IC区 -92-351-FBW ct LIATER ICE 1353 Relinguished by Received by: Relinguished by: Received by 1/23/1725 11:.0d Received by: Relinquished by: **delhod of Shipment** Fed-X-press

PT 2 NET Project Manager—Yellow

PT 1 - ORIGINAL

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### **ANALYTICAL REPORT**

Report To:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

Project:

PPG RUSH SOIL VOAs

11/10/1992

NET Job Number: 92.34511

National Environmental Testing

NET Atlantic, Inc. Cambridge Division 12 Oak Park Bedford, MA 01730

### **NET Cambridge Division**

### ANALYTICAL REPORT

Report To:

Reported By:

Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor

Pittsburgh, PA 15222

National Environmental Testing NET Atlantic, Incorporated Cambridge Division

12 Oak Park

Bedford, MA 01730

Report Date: 11/10/1992

Collected By: ICF

NET Job Number: 92.34511

Project: PPG RUSH SOIL VOAs

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs

Airbill No: 3977256920

NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler NET Project Manager Michael F. Delaney, Ph.D.

Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET 1D			DATE REC'D	MATRIX		
CV-92-0524-124	68790	10/31/1992	10:25	11/02/1992	SOIL		
CV-92-0525-145	68791	10/31/1992	10:40	11/02/1992	SOIL		
CV-92-0526-S100	68792	10/31/1992	11:08	11/02/1992	SOIL		
CV-92-0527-W6	68793	10/31/1992	11:45	11/02/1992	SOIL		
CV-92-0528-W44	68794	10/31/1992	11:30	11/02/1992	SOIL		
CV-92-0529-FBW	68795	10/31/1992	11:55	11/02/1992	BLANK		

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample 1D: CV-92-0524-124

Parameter	Result	Units	Analysis Date	Analyst	
To Malasila by on the 02/0 o	*************				-
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	11/05/1992	dhg	1
Benzene	<6.0	ug/Kg		•.*	إيساد
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			Sept.
Bromomethane	<6.0	ug/Kg			
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chioromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg	•		
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Hexanone	<6.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chloride	21	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
Toluene	<6.0	ug/Kg			
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<6.0	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	<6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
Vinyl Chloride	<6.0	ug/Kg			
m-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			
PATITION	~0.0	U\$/K\$			

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0525-145

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					
Acetone	<5.0	ug/Kg	11/05/1992	dhg	
Benzene	<5.0	ug/Kg	,	·	and the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of t
Bromodichloromethane	<5.0	ug/Kg			
Bromoform	<5.0	ug/Kg			
Bromomethane	<5.0	ug/Kg			*
2-Butanone (MEK)	<5.0	ug/Kg			
Carbon Disulfide	<5.0	ug/Kg			
Carbon Tetrachloride	<5.0	ug/Kg			
Chlorobenzene	<5.0	ug/Kg			
Chloroethane	<5.0	ug/Kg			
2-Chloroethylvinyl ether	<5.0	ug/Kg			
Chloroform	<5.0	ug/Kg			
Chloromethane	<5.0	ug/Kg			
Dibromochloromethane	<5.0	ug/Kg			
1,2-Dichlorobenzene	<5.0	ug/Kg			
1,3-Dichtorobenzene	<5.0	ug/Kg			
1,4-Dichlorobenzene	<5.0	ug/Kg			
1,1-Dichloroethane	<5.0	ug/Kg			
1,2-Dichloroethane	<5.0	ug/Kg			
1,1-Dichloroethene	<5.0	ug/Kg			
trans-1,2-Dichloroethene	<5.0	ug/Kg			
1,2-Dichloropropane	<5.0	ug/Kg			
cis-1,3-Dichloropropene	<5.0	ug/Kg			
trans-1,3-Dichloropropene	<5.0	ug/Kg			
Ethylbenzene	<5.0	ug/Kg			
2-Hexanone	<5.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg ug/Kg			
Methylene Chloride	13	ug/Kg			
Styrene	<5.0	ug/Kg			
1,1,2,2-Tetrachioroethane	<5.0	ug/Kg ug/Kg			
Tetrachloroethene	<5.0	ug/Kg ug/Kg			
Toluene	<5.0				
1,1,1-Trichloroethane	<5.0	ug/Kg ug/Kg			
1,1,2-Trichloroethane	<5.0	= = =			
Trichloroethene	<5.0 <5.0	ug/Kg			
Trichlorofluoromethane		ug/Kg			
Vinyl Acetate	<5.0	ug/Kg			
•	<5.0	ug/Kg			
Vinyl Chloride	<5.0	ug/Kg			
m-Xylene	<5.0	ug/Kg			
o-Xylene	<5.0	ug/Kg			
p-Xyl ene	<5.0	ug/Kg			

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0526-S100

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 \$					
Acetone	<6.0	⊔g/Kg	11/05/1992	dhg	
Benzene	<6.0	ug/Kg	11,00,1772	-	
Bromodichloromethane	<6.0	ug/Kg		ings ,	
Bromoform	<6.0	ug/Kg			.:
Bromomethane	<6.0	ug/Kg		•	1
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichlorobenzene	<6.0	ug/Kg			
1,3-Dichlorobenzene	<6.0	ug/Kg			
1,4-Dichlorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichloropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Hexanone	<6.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chloride	31	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
Toluene	<6.0	ug/Kg			
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<6.0	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	<6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
Vinyl Chloride	<6.0	ug/Kg			
m-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xyl ene	<6.0	ug/Kg			
		<del>-</del>			

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0527-W6

			Analysis		
Parameter	Result	Units	Date	Analyst	
TCL Volatiles by GC/MS 8240 S					
Acetone	<6.0	ug/Kg	11/08/1992	dhg	
Benzene	<6.0	ug/Kg	11/00/1992	ung	
Bromodichloromethane	<6.0	ug/Kg			
Bromoform	<6.0	ug/Kg			
Bromomethane	<6.0	ug/Kg			₽Director
2-Butanone (MEK)	<6.0	ug/Kg			
Carbon Disulfide	<6.0	ug/Kg			
Carbon Tetrachloride	<6.0	ug/Kg			
Chlorobenzene	<6.0	ug/Kg			
Chloroethane	<6.0	ug/Kg			
2-Chloroethylvinyl ether	<6.0	ug/Kg			
Chloroform	<6.0	ug/Kg			
Chloromethane	<6.0	ug/Kg			
Dibromochloromethane	<6.0	ug/Kg			
1,2-Dichtorobenzene	<6.0	ug/Kg			
1,3-Dichtorobenzene	<6.0	ug/Kg			
1,4-Dichtorobenzene	<6.0	ug/Kg			
1,1-Dichloroethane	<6.0	ug/Kg			
1,2-Dichloroethane	<6.0	ug/Kg			
1,1-Dichloroethene	<6.0	ug/Kg			•
trans-1,2-Dichloroethene	<6.0	ug/Kg			
1,2-Dichtoropropane	<6.0	ug/Kg			
cis-1,3-Dichloropropene	<6.0	ug/Kg			
trans-1,3-Dichloropropene	<6.0	ug/Kg			
Ethylbenzene	<6.0	ug/Kg			
2-Kexanone	<6.0	ug/Kg			
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg			
Methylene Chloride	<6.0	ug/Kg			
Styrene	<6.0	ug/Kg			
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg			
Tetrachloroethene	<6.0	ug/Kg			
Toluene	<6.0	ug/Kg			
1,1,1-Trichloroethane	<6.0	ug/Kg			
1,1,2-Trichloroethane	<6.0	ug/Kg			
Trichloroethene	<6.0	ug/Kg			
Trichlorofluoromethane	<6.0	ug/Kg			
Vinyl Acetate	<6.0	ug/Kg			
Vinyl Chloride	<6.0	ug/Kg			
m-Xylene	<6.0	ug/Kg			
o-Xylene	<6.0	ug/Kg			
p-Xylene	<6.0	ug/Kg			

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0528-W44

			Analysis	
Parameter	Result	Units	Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		_
Bromodichloromethane	<6.0	ug/Kg		. with
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		<u>.</u>
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg	•	
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichtoropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xyl ene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0529-FBW

			Analysis		
Parameter	Result	Units	Date	Analyst	
		*************			••
TCL Volatiles by GC/MS 624 AQ	• •				
Acetone	<5.0	ug/L	11/04/1992	cdl	
Benzene	<5.0	ug/L			The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s
Bromodichloromethane	<5.0	ug/L			
Bromoform	<5.0	ug/L		* -	$\underline{\underline{\underline{d}}} \equiv \overline{\mathbb{Q}}^{(1)} \circ \overline{\mathbb{Q}} \circ \underline{\mathbb{Q}} \circ \mathbb{Q} \circ \mathbb{Q}$
Bromomethane 2.8	<5.0	ug/L			
2-Butanone (MEK)	<5.0	ug/L			
Carbon Disulfide	<5.0	ug/L			
Carbon Tetrachloride	<5.0	ug/L			
Chlorobenzene	<5.0	ug/L			
Chloroethane	<5.0	ug/L			
2-Chloroethylvinyl ether	<5.0	ug/L			
Chloroform	<5.0	ug/L			
Chloromethane	<5.0	ug/L			
Dibromochloromethane	<5.0	ug/L			•
1,2-Dichlorobenzene	<5.0	ug/L			
1,3-Dichlorobenzene	<5.0	∪g/L			
1,4-Dichlorobenzene	<5.0	ug/L			
1,1-Dichloroethane	<5.0	ug/L			
1,2-Dichloroethane	<5.0	ug/L	•		
1,1-Dichloroethene	<5.0	ug/L			
trans-1,2-Dichloroethene	<5.0	ug/L			
1,2-Dichloropropane	<5.0	ug/L			
cis-1,3-Dichloropropene	<5.0	ug/L			
trans-1,3-Dichloropropene	<5.0	ug/L			
Ethylbenzene	<5.0	ug/L			
2-Hexanone	<5.0	ug/L			
4-Methyl-2-pentanone (HIBK	<5.0	ug/L			
Methylene Chloride	<5.0	ug/L			•
Styrene	<5.0	ug/L			
1,1,2,2-Tetrachloroethane	<5.0	ug/L			-
Tetrachioroethene	<5.0	ug/L			
Toluene	<5.0	ug/L			
1,1,1-Trichloroethane	<5.0	ug/L			
1,1,2-Trichloroethane	<5.0	ug/L			
Trichloroethene	<5.0	ug/L			
Trichlorofluoromethane	<5.0	ug/L			
Vinyl Acetate	<5.0	ug/L			
Vinyl Chloride	<5.0	ug/L			
m-Xylene	<5.0	ug/L			
o-Xylene	<5.0	ug/L			
p-Xylene	<5.0	ug/L			

### **NET Cambridge Division**

### **QUALITY CONTROL DATA**

Client: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date: 11/10/1992

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

\$\$1 \$\$2 \$\$3 \$\$4 \$\$5 \$\$6 \$\$7 \$\$8 \$\$9 \$\$10 \$\$11 \$\$512

Bromofl 1,2-Dic Toluene Bromofl 1,2-Dic Toluene

					Perce	nt Reco	very					*	
Sample ID	NET ID	Matrix SS1	SS2	\$\$3	<b>SS4</b>	<b>SS</b> 5	<b>SS6</b>	SS7	\$\$8	<b>SS9</b>	<b>SS10</b>	\$\$11	SS12
CV-92-0524-124	68790 SOIL				76	81	95						
CV-92-0525-145	68791 SOII	L			85	88	119						
CV-92-0526-S100	68792 SOII	L			86	98	111			1,77		Anna Committee	
CV-92-0527-W6	68793 SOIL	L			88	78	93				8 20 30	e.	
CV-92-0528-W44	68794 SOIL	L			82	96	115		•		follows:	• .	
CV-92-0529-FBW	68795 BLAN	NK 107	100	95									

Notes:

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.

Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:

Decachl = Decachlorobiphenyl Dibutyl = Dibutylchlorendate

Tetrach = Tetrachioro-m-xylene

2,4,6-T = 2,4,6-Tribromophenol

Volatile Surrogate Standards:

Bromofl = Bromofluorobenzene 1,2-Dichl = 1,2-Dichloroethane-d4 Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

Semivolatlile Surrogate Standards:

2-Fluor (1st) = 2-Fluorobiphenyl Phenol- = Phenol-d6

2-Fluor (2nd) = 2-Fluorophenol Nitrobe = Nitrobenzene-d5 p-Terph = p-Terphenyl

<u>Herbicides Surrogate Standard:</u>

2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:

2-Fluor = 2-Fluorobiphenyl

para-Te = para-Terphynyl

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

#### Method Blank Analysis Data

	Method Bla	nk Analysis Da	ata		
			Run	Run	Analyst
Test Name	Result	Units	Batch	Date	Initials
 TCL Volatiles by GC/MS 8240 S					عر
Bromofluorobenzene	108	% recov.	281	11/05/1992	dhg :
1,2-Dichloroethane-d4	102	% recov.	281	11/05/1992	dhg
Toluene-d8	107	% recov.	281	11/05/1992	dhg
Acetone	<5.0	ug/Kg	281	11/05/1992	dhg
Benzene	<5.0	ug/Kg	281	11/05/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	281	11/05/1992	dīng
Bromoform	<5.0	ug/Kg	281	11/05/1992	dhg
Bromomethane	<5.0	ug/Kg	281	11/05/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	281	11/05/1992	<b>d) g</b>
Carbon Disulfide	<5.0	ug/Kg	281	11/05/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	281	11/05/1992	ding
. Chlorobenzene	<5.0	ug/Kg	281	11/05/1992	<b>dhg</b>
Chloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	281	11/05/1992	dhg
Chloroform	<5.0	ug/Kg	281	11/05/1992	dhg
Chloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,3-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,4-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,1-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	281	11/05/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg
Ethylbenzene	<5.0	ug/Kg	281	11/05/1992	dhg
2-Hexanone	<5.0	ug/Kg	281	11/05/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	281	11/05/1992	ďňg
Methylene Chloride	<5.0	ug/Kg	281	11/05/1992	dhg
Styrene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
Tetrachloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
Toluene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,2-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg -
Trichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
Trichlorofluoromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Vinyl Acetate	<5.0	ug/Kg	281	11/05/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	281	11/05/1992	dhg
m-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
o-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
p-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
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Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

### Method Blank Analysis Data

	Method Bla				
Test Name	Dla	11.54-	Run	Run	Analyst
TEST NAME	Result	Units	Batch	Date	Initials
TCL Volatiles by GC/MS 8240 S					*
Bromofluorobenzene	107	% recov.	283	11/08/1992	dhg
1,2-Dichloroethane-d4	91	% recov.	283	11/08/1992	dhg
Toluene-d8	110	% recov.	283	11/08/1992	dhg
Acetone	<5.0	ug/Kg	283	11/08/1992	dhg
Benzene	<5.0	ug/Kg	283	11/08/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Bromoform	<5.0	ug/Kg	283	11/08/1992	dhg
Bromomethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Disulfide	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	283	11/08/1992	
Chlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroform	<5.0	ug/Kg	283	11/08/1992	dhg
Chloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,3-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,4-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	283	11/08/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
Ethylbenzene	<5.0	ug/Kg	283	11/08/1992	dhg
2-Rexanone	<5.0	ug/Kg	283	11/08/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	283	11/08/1992	dhg
Methylene Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
Styrene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Tetrachloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
Toluene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,2-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Trichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
Trichlorofluoromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Acetate	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
m-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
o-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
p-Xyliene	<5.0	ug/Kg	283	11/08/1992	dhg

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

#### Method Blank Analysis Data

	nethod Bla	nk Analysis Da	878		
			Run	Run	Analyst
Test Name	Result	Units	Batch	Date	Initials
TCL Volatiles by GC/MS 624 AQ					,3
Bromofluorobenzene	111	% recov.	846	11/04/1992	cdi
1,2-Dichloroethane-d4	99	% recov.	846	11/04/1992	cdl
Toluene-d8	108	% recov.	846	11/04/1992	cdl
Acetone	<5.0	ug/L	846	11/04/1992	cdl
Benzene	<5.0	ug/L	846	11/04/1992	cdl
Bromodichloromethane	<5.0	ug/L	846	11/04/1992	cdl
Bromoform	<5.0	ug/L	846	11/04/1992	cdl
Bromomethane	<5.0	ug/L	846	11/04/1992	cdl
2-Butanone (MEK)	<5.0	ug/L	846	11/04/1992	.cdl
Carbon Disulfide	<5.0	ug/L	846	11/04/1992	cdl
Carbon Tetrachloride	<5.0	ug/L	846	11/04/1992	cdl = 1 = 1 = 1
Chlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
Chloroethane	<5.0	ug/L	846	11/04/1992	cdl
2-Chloroethylvinyl ether	<5.0	ug/L	846	11/04/1992	cdl
Chloroform	<5.0	ug/L	846	11/04/1992	cdl
Chloromethane	<5.0	ug/L	846	11/04/1992	cdl
Dibromochloromethane	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,3-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,4-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,1-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl
i,2-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,1-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl
trans-1,2-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichloropropane	<5.0	ug/L	846	11/04/1992	cdl
cis-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl
trans-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl
Ethylbenzene	<5.0	ug/L	846	11/04/1992	cdl
2-Hexanone	<5.0	ug/L	846	11/04/1992	cdl
4-Methyl-2-pentanone (MIBK	<5.0	ug/L	846	11/04/1992	cdl
Methylene Chloride	<5.0	ug/L	846	11/04/1992	cdl
Styrene	<5.0	ug/L	846	11/04/1992	cdl
1,1,2,2-Tetrachloroethane	<5.0	ug/L	846	11/04/1992	cdl
Tetrachloroethene	<5.0	ug/L	846	11/04/1992	cdl
Toluene	<5.0	ug/L	846	11/04/1992	cdl
1,1,1-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,1,2-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl
Trichloroethene	<5.0	ug/L	846	11/04/1992	cdl
Trichlorofluoromethane	<5.0	∪g/L	846	11/04/1992	cdl
Vinyl Acetate	<5.0	ug/L	846	11/04/1992	cdl
Vinyl Chloride	<5.0	ug/L	846	11/04/1992	cdl
m-Xylene	<5.0	ug/L	846	11/04/1992	cdl
o-Xylene	<5.0	ug/L	846	11/04/1992	cdl
p-Xyléne	<5.0	ug/L	846	11/04/1992	cdl

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date: 11/10/1992

#### Matrix Spike/Matrix Spike Duplicate Results

	Spike	Sample		MS	MS %	MSD	MSD %	
Compound	Amount	Result	Units	Result	Recovery	Result	Recovery	RPD
TCL Volatiles by GC/MS 8240	S							
Acetone	0.0	<5.0	ug/Kg					
Benzene	50.0	<5.0	ug/Kg	54.1	108.20	45.2	90.40	17.80
Bromodichloromethane	0.0	<5.0	ug/Kg					
Bromoform	0.0	<5.0	ug/Kg					
Bromomethane	0.0	<5.0	ug/Kg					
2-Butanone (MEK)	0.0	<5.0	ug/Kg					
Carbon Disulfide	0.0	<5.0	ug/Kg					
Carbon Tetrachloride	0.0	<5.0	ug/Kg				والمراج المعدودي	
Chlorobenzene	50.0	<5.0	ug/Kg	47.4	94.80	38.8	77.60	20.00
Chloroethane	0.0	<5.0	ug/Kg			3.	in a contract	
2-Chloroethylvinyl ether	0.0	<5.0	ug/Kg					
Chloroform	0.0	<5.0	ug/Kg					
Chloromethane	0.0	<5.0	ug/Kg					
Dibromochloromethane	0.0	<5.0	ug/Kg					
1,2-Dichlorobenzene	0.0	<5.0	ug/Kg		_			
1,3-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,4-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,1-Dichloroethane	0.0	<5.0	ug/Kg					
1,2-Dichloroethane	0.0	<5.0	ug/Kg					
1,1-Dichloroethene	54.3	12	ug/Kg	66	99.40	43.8	58.60	51.60
trans-1,2-Dichloroethene	0.0	<5.0	ug/Kg					
1,2-Dichloropropane	0.0	<5.0	ug/Kg					
cis-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
trans-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
Ethylbenzene	0.0	<5.0	ug/Kg					
2-Hexanone	0.0	<5.0	ug/Kg					
4-Methyl-2-pentanone (MIBK	0.0	<5.0	ug/Kg					
Methylene Chloride	0.0	<5.0	ug/Kg					
Styrene	0.0	<5.0	ug/Kg					
1,1,2,2-Tetrachloroethane	0.0	<5.0	ug/Kg					
Tetrachioroethene	0.0	<5.0	ug/Kg					
Toluene	50.0	<5.0	ug/Kg	61.0	122.00	45.6	91.20	28.80
1,1,1-Trichloroethane	0.0	<5.0	ug/Kg					
1,1,2-Trichloroethane	0.0	<5.0	ug/Kg		•			
Trichloroethene	50.0	<5.0	ug/Kg	36.7	73.40	31.0	62.00	16.80
Trichlorofluoromethane	0.0	<5.0	<b>∪g</b> /Kg					
Vinyl Acetate	0.0	<5.0	ug/Kg					
Vinyl Chloride	0.0	<5.0	ug/Kg					
m-Xylene	0.0	<5.0	ug/Kg					
o-Xylene	0.0	<5.0	ug/Kg					
p-Xylene	0.0	<5.0	ug/Kg					

NOTE: Data reported for spiked samples were analyzed in the same batch, but may not necessarily be that of your sample.

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							CHA	AIN OF CUST	ODY	RECOR	D	$\overline{C}$	AG(	- 492315	[I]	3358
	PROJ.  04512-0  SAMPLER  J. D.  STA. NO.	10/-00 RS: (Sign	alure)		cle	v.1/e FCR	A CIUSURE	NO. OF CON- TAINERS							7	REMARKS
	JIA. NO.	DATE	TIML	8	GR	SIATIO	NEOCATION		19	///	_					
	0524-124				X	Incinerator	FAD	_	X					Analyze	for V	Method 8240
	-0525-145				X	Incinerato	PAD		X					EPA-5W	1-846	Method 8240
CV AZ-	0526-5100	10/31	1108		X	SOUTH PAD			X				$\perp$			
(V-9.	2521-WU	10/31	1145		X	WEST PAD		_	X							
CV-92	-U528-1J44	10/31	1130		X				X					<u></u>		
CV-92	<u>-0529-FBN</u>	10/31	1155		X	WEST PAI	<b>)</b>		X							
													$\dashv$			
						<u> </u>										
	Relinquished. Dung	lentr	less	k	10		Received by: (Signatu	te		quished by:				Date:	<i>M</i> 45	Received by: (Signature)
	Relinquish	ed by: (Sig	gnature)			Date/Time	Received by: (Signatu	ure)	Relin	quished by:	(Signal	iure)		Date/	Time	Received by: (Signature)
	Relinquishe	ed by: (Sig	gnature)			Date/Time	Received for Laborato (Signature)	ory by:		Date/Time	е	Re	marks			
			Distrib	ution; (	Origina	Accompanies Shipmen	t; Copy to Coordinator Field	Files								

### ATTACHMENT D

PPG Circleville Plant Safety Rules and Instructions

Partial Closure Plan 04512-01-B

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Revision: 1 Date: January 6, 1993

# CIRCLEVILLE PLANT SAFETY RULES AND INSTRUCTIONS

- 1. The PPG Plant in Circleville is a manufacturer of Plastics and Resins. As a result, the products which are most used in the plant are paint thinners and solvents which are highly flammable. The possible presence of solvent vapors must always be considered during all phases of construction. In view of these hazards, the following safety rules are established:
  - A. No smoking anywhere on the premises except those areas which are especially designated.
  - Strike Anywhere Matches (Kitchen Matches) are not allowed in the plant.
  - C. No open flames, electric welding, or soldering without permission of the plant Engineering Department. Permissions for an open flame is not permission to smoke. Do not carry flint strikers for gas torches into hazardous areas. Use spark proof tolls and explosion proof equipment where needed. Use safety flashlights only.
  - D. Before welding, drilling or use of non-explosive proof equipment, a permit must be secured from the Engineering Office and signed by the Safety Department and Area Supervisor before job can be started.
  - E. No use of spark-causing reciprocating equipment; e.g., chisels, saws, hammers, etc., without permission of the Plant Engineering Department.
  - F. All equipment must be in first class condition.
  - G. Post signs or rope areas off when working overhead.
  - H. When announced over P.A. system that additions are being made to the kettles, evacuate 2nd and 3rd floor MR & RD areas until all clear is announced.
  - Stay clear of areas marked "75-10 in use;" this is a cleaning compounds that makes floors slippery and can cause severe burns.
  - J. Ground cables for welding should be attached directly to work piece rather than using plant structure for ground.

- K. Violations of Safety Rules constitute breach of contract and is cause for removal of Contractor. Also constitutes immediate discharge of employee or employees guilty of safety violation.
- L. Do not wear metal soled or heeled shoes or shoes with a metal cap or plate attached.
- M. Do not horseplay.
- N. Do not block fire extinguishers, exists, or alarm boxes.
- Do not use packages or drums in place of ladders.
- P. Do not jump from docks, trucks or platforms.
- Q. Eat lunch in lunch area only. We suggest washing the hands before eating,
- R. Report any malfunction or potential safety hazards to your foreman or superintendent.
- S. Housekeeping is part of your job.
- 2. When cutting into a pipe line or vessel, always know the code number of material that the pipe line or vessel has been used for. If you should accidentally get splashed, remove saturated clothing and flush the affected area of body with water for ten (10) minutes. Do not put saturated clothes or shoes back on unless you are advised to do so. Report incident with code number to your immediate foreman or superintendent and ask him to contact someone from PPG and they will supply information for additional treatment if needed.
- The parking of contractor's cars or trucks within the plant will not be permitted without approval of the plant Engineering Department.
- Safety glasses and hard hats must be worn at all times within the fenced area, unless you are in the cafeteria of one of the designated break areas.
- 5. When a fire alarm sounds, leave work area and go to parking lot until all clear. If you see smoke or fire, turn in alarm and proceed to outside area. Our fire alarm is a horn blast for 10 seconds, followed by a voice annunciation over the public address system identifying the zone of origin. The "All Clear" will be announced orally over the same public address system.

### ATTACHMENT E

Risk Assessment

### **RISK ASSESSMENT**

## FOR RCRA PARTIAL CLOSURE

### prepared for

getterasti, in it

# PPG INDUSTRIES, INC. COATINGS AND RESINS DIVISION Circleville, Ohio

prepared by

ICF KAISER ENGINEERS, INC. Four Gateway Center Pittsburgh, Pennsylvania 15222

February 18, 1993

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#### EXECUTIVE SUMMARY

This human health risk assessment was conducted in support of the RCRA partial closure requirements for three interim status hazardous waste management units at the PPG Industries, Inc. Coatings and Resins Division in Circleville, Ohio and is a companion document to the Partial Closure Plan by ICF Kaiser Engineers (ICF KE). The report was prepared according to the standards specified by the Ohio Environmental Protection Agency (OEPA) in the "Closure Plan Guidance Manual" dated May 1, 1991. Approaches recommended by the United States, Environmental Protection Agency (U.S. EPA) in the "Risk Assessment Guidance for Superfund" and successor documents are also followed. The results of the risk assessment indicate that the units may be closed in a manner that eliminates the need for further maintenance and concern over post-closure escape of residual chemicals. Thus, the risk assessment provides criteria to confirm that the remaining low level residuals do not pose a threat to public health.

The three interim status hazardous waste management units addressed in this risk assessment are the Incinerator area, South Pad area and West Pad area. Data regarding the environmental conditions in these areas were obtained from the sampling and analyses performed by ICF KE and other contractors in 1989 and 1992. Based on these investigations, the chemicals of concern for the three areas consist of methylene chloride, ethylbenzene, xylene, methylisobutyl ketone (MIBK), toluene and methanol. In conforming with OEPA requirements, maximum concentrations of chemicals detected were incorporated into the risk assessment.

Specified hypothetical receptors include a residential adult and a residential child. The following exposure pathways were evaluated quantitatively according to OEPA guidance: ingestion of chemicals in soil; dermal contact with chemicals in soil; ingestion of chemicals in groundwater; dermal contact with chemicals in groundwater; inhalation of chemicals associated with airborne particulates originating from the units; inhalation of volatile chemicals from soil; and inhalation of volatile chemicals from water during showering or bathing. Exposure factors as specified by the OEPA were utilized, despite the fact that these are inconsistent with reasonable exposure conditions. It is important to note that the groundwater exposure pathway and calculated risks are included for information purposes only since TCLP data have yet to be obtained. For definition of acceptable dose standards, U.S. EPA reference doses and cancer slope factors were incorporated into the calculations from the Integrated Risk Information System (IRIS).

For each unit, summed noncarcinogenic hazards are within the acceptable limits (less than one) established by the OEPA. Summed theoretical excess lifetime cancer risks are also within the OEPA RCRA closure requirements of one in one million. Many factors incorporated into this risk assessment to comply with OEPA requirements utilize overconservatisms for the exposure assumptions, and overestimate noncancer hazards and theoretical excess lifetime cancer risks. Approaches for incorporating animal to human dose extrapolation and high-to-low dose extrapolation include conservatisms which are inherent in the U.S. EPA recommended risk assessment process. The OEPA approach further compounds these overconservatisms by requiring the incorporation of the highest detected value for each chemical into the risk assessment, excessive duration and frequency of exposure conditions, and the prohibition of environmental fate and transport factors, particularly for groundwater. Although these considerations are not necessarily consistent with the U.S. EPA's reasonable maximum exposure concept and reflect a scenario not achievable under actual conditions, they have been incorporated in this risk assessment.

The conclusion of this assessment is that summed noncarcinogenic hazards and summed theoretical excess lifetime cancer risks associated with the site constituents in each of the areas of concern are

considered acceptable according to OEPA RCRA closure requirements. No post-closure maintenance is recommended.

#### 1.0 INTRODUCTION

This risk assessment was prepared by ICF Kaiser Engineers, Inc. (ICF KE) for PPG Industries, Inc., Coatings and Resins Division, Circleville, Ohio in support of the implementation of the Partial Closure Plan for three interim status hazardous waste management units. This report is prepared in compliance with Ohio EPA's (OEPA) Closure Plan Guidance Manual (1991) despite the fact that some of the required approaches are unachievable under actual conditions: Approaches recommended by the U.S. EPA (1989a; 1989b) are also incorporated. The document is designed to identify non-cancer hazards and theoretical excess lifetime cancer risks associated with current site conditions. This document is intended to function as a companion document to the Partial Closure Plan by ICF KE, dated February, 1993. As such, the sampling and analytical data incorporated into this report are derived from that source. It is important to note that the groundwater exposure pathway and calculated risks are included for informational purposes only since TCLP data have yet to be obtained.

#### 1.1 PURPOSE OF THE RISK ASSESSMENT

Risk assessment is defined as the scientific evaluation of human and environmental health impacts posed by a particular substance or mixture of substances. The purpose of this risk assessment is to provide a quantitative analysis, in a manner consistent with the required approaches of the OEPA, of the likelihood of adverse effects associated with potential residential exposures to chemicals in environmental media in the units.

Specific objectives of this risk assessment are:

- to provide an analysis of baseline risks according to OEPA requirements;
- to provide a basis for determining levels of chemicals that can remain onsite and still be adequately protective of public health; and
- to provide a consistent process of evaluating and documenting public health protective measures.

To achieve these goals, the scientific basis and validity of values incorporated into the assessment are considered and discussed in the context of primary research literature in order to provide a frame of reference for the conclusions.

#### 1.2 APPROACH

The organization of this risk assessment follows the guidelines originally prepared by the National Academy of Sciences (NAS, 1983), which suggest that risk assessments should contain some or all of the following four steps:

Hazard Identification (Identification of Chemicals of Concern). The focus of this step is to evaluate site investigation data, and identify chemicals of concern;

graph street in

- Dose-Response Assessment (Toxicity Assessment). This step involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern;
- **Exposure Assessment.** Identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and
- Risk Characterization. Description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action.

#### 1.3 REPORT ORGANIZATION

This report is organized in a manner consistent with the above mentioned sections of a risk assessment. The sections of the report are described below:

- Section 1 provides an introduction to the report.
- Section 2 describes the areas of concern at the site and the chemicals of concern in those areas.
- Section 3 describes the theoretical basis for derivation of health criteria for the chemicals of concern and presents the specific health criteria and their bases.
- Section 4 presents the likely human receptors of concern and utilizes defined exposure factors to estimate the magnitude of exposure of those receptors to the chemicals of concern.
- Section 5 presents the results of the analysis in which the risks associated with the defined exposures are quantified and summarized.
- Section 6 describes the uncertainties associated with the exposures and risks calculated.
- Section 7 presents the conclusions of the report.
- Section 8 presents the references used in the report.

#### 2.0 IDENTIFICATION OF CHEMICALS OF CONCERN

This section presents the basis for identification and selection of the chemicals of concern. In addition, the representative concentrations of each of the chemicals of concern and their distribution in each area of concern are also presented.

#### 2.1 SITE BACKGROUND

PPG owns and operates a resin manufacturing facility located on Pittsburgh Road approximately two miles south of Circleville, Pickaway County, Ohio. Resins produced at the facility are used in paints and industrial coatings serving a variety of commercial industries. The surrounding area is classified as industrial and agricultural. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat. The nearest residential development is approximately one-half mile from the plant boundary.

The facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The incinerator operated for approximately seventeen years (1971-1988) and drum storage pads were used for periods of five to twenty-four years. In 1987, a larger incinerator, the Energy Recovery Unit (ERU), began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants in North America and processes them for incineration.

Following the startup and operation of the ERU at the Circleville site, the drum storage pads (West and South pads) and Liquid Waste Incinerator were no longer used. The Liquid Waste Incinerator and the drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in the Partial Closure Plan. Closure of the three units included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

#### 2.2 DESCRIPTION OF AREAS OF CONCERN

The descriptions of the units are based in part on information contained in the RCRA Interim Status permit and are presented below. The former locations of the Liquid Waste Incinerator, West Pad and South Pad are indicated on Figure 1.

#### 2.2.1 <u>Liquid Waste Incinerator</u>

This unit consisted of a liquid waste incinerator with three lines (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. The incinerator area included a concrete containment area located southeast of the incinerator pad. Waste characterization for those materials treated in the incinerator included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

F003: Still sludge including xylene, ethylbenzene and methylisobutyl ketone; and

F005: Still sludge including toluene and methyl ethyl ketone.

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

#### 2.2.2 Drum Storage Area; South Pad

This unit consisted of a flat, packed gravel area approximately 90 feet by 240 feet. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methyl toluene or methyl ethyl ketone).

#### 2.2.3 Drum Storage Area; West Pad

This unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10 feet by 100 feet. This unit was in use from 1975 to 1985. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

F002: Spent methylene chloride.

#### 2.2.4 Drum Storage Area; Still Pad

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East yard were removed and replaced.

#### 2.3 DATA COLLECTION

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Soil sampling results from 1989 and 1992 sampling events are included in Appendix A. The results of the sampling and analyses are presented as follows:

#### 2.3.1 Incinerator Area

The soil around the incinerator was tested in 1989 for the constituents listed below. The representative sample points indicated on the sampling grids in this plan were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. A power auger was used to remove the top four to six inches of soil. The loose soil was removed and a grab sample was collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

#### 2.3.2 South Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in the previous section. Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080.

#### 2.3.3 West Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in Section 2.3.1. One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080.

#### 2.4 IDENTIFICATION OF CHEMICALS OF CONCERN

As required by OEPA, chemicals which were detected in each area during the sampling efforts described above were incorporated into this risk assessment. The chemicals of concern for each unit are presented in Table 2-1.

#### 2.5 REPRESENTATIVE CONCENTRATIONS OF CHEMICALS OF CONCERN

As required by OEPA, the representative chemical concentrations for the constituents of concern for use in this risk assessment were taken as the highest detected value in each unit. These values are presented in Table 2-2. As required, the maximum concentration detected at any one grid point was used to quantify the exposure from soil, air and water in each unit.

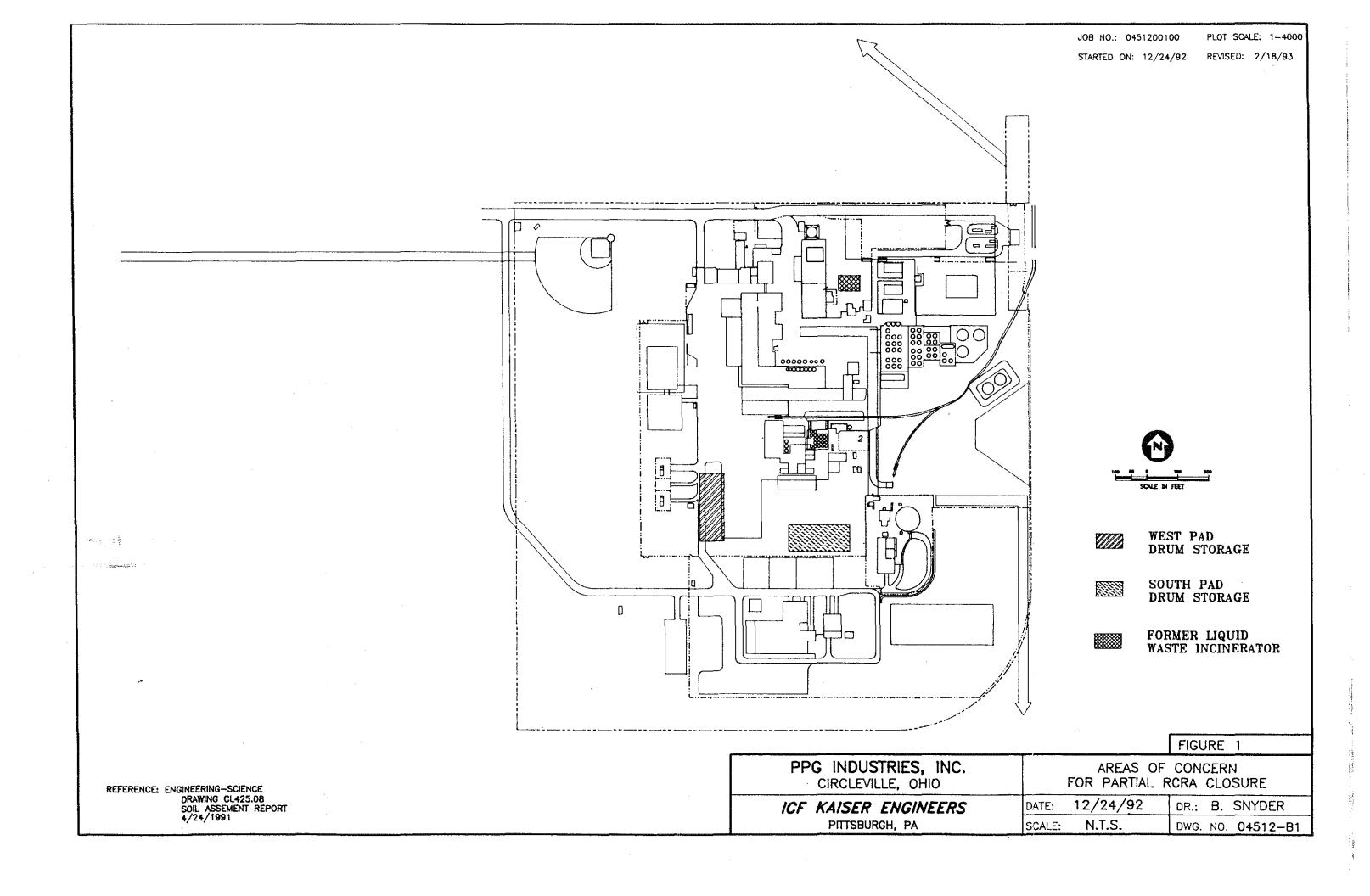


TABLE 2-1
SUMMARY OF CHEMICALS OF CONCERN

Area Description	Chemicals of Concern		
Incinerator Area	Xylene Ethylbenzene Methylene Chloride		
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride		
West Pad	Xylene Ethylbenzene Methanol Toluene		

See Figure 1 for the location of each area of concern.

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TABLE 2-2

MAXIMUM DETECTED CHEMICAL CONCENTRATIONS

CHEMICAL	AREA			
	Incinerator Area	South Pad	West Pad	
Xylene	4.0	8.01	2.2	
Ethylbenzene	2.0	2.0	0.229	
MIBK	ND (<.005)	0.006	ND <sup>2</sup> (<.005)	
Methanol ND (<.968)		ND (<.968)	0.968	
Toluene	ND (<.190)	21.0	1.34	
Methylene Chloride 4.0		3.0	ND (<.300)	

<sup>&</sup>lt;sup>1</sup> Values are in parts per million (ppm).

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<sup>&</sup>lt;sup>2</sup> ND - Chemical was not detected in this area. Detection limits are listed for non-detects.

#### 3.0 DOSE-RESPONSE ASSESSMENT

Dose-response assessment is the process of characterizing the relationship between the dose of a chemical and the anticipated incidence of an adverse health effect (Preuss and Ehrlich, 1987). The majority of existing knowledge about the dose-response relationship is based on data collected from animal studies (usually rodents) or human occupational exposures, and the theory about what might occur in humans after exposure to environmental doses.

The U.S. EPA has developed dose-response assessment techniques to set "acceptable" levels of human exposure to chemicals in the environment. These U.S. EPA-derived risk criteria address both potential carcinogenic and chronic noncarcinogenic adverse health effects. The following section discusses the derivation of the acceptable dose levels, the manner in which these levels are used in this risk assessment, and the limitations of these values. The limitations are addressed in greater detail in the uncertainty section (Section 6.0).

#### 3.1 BACKGROUND ON NONCARCINOGENIC RESPONSE

It is widely accepted that non-cancer biological effects of chemical substances occur only after a threshold dose is achieved (Klaasen et. al., 1986). For the purposes of establishing non-cancer criteria, this threshold dose is usually estimated from the no observed adverse effect level (NOAEL) or the lowest observed adverse effect level (LOAEL) determined from chronic animal studies. The NOAEL is defined as the highest dose at which no adverse effects occur, while the LOAEL is defined as the lowest dose at which adverse effects are discernable.

NOAELs and LOAELs derived from animal studies or human data are used by the U.S. EPA to establish reference doses (RfDs) for human exposure. An RfD is a dose which is not expected to exceed an acceptable level of noncarcinogenic risk over a set duration of exposure. Uncertainty factors are incorporated into RfDs in an attempt to account for limitations in the quality or quantity of available data.

#### 3.2 ESTIMATING THE LIKELIHOOD OF ADVERSE NONCARCINOGENIC RESPONSE

The dose is the estimated amount of chemical received by the receptor. The relationship between the RfD and the received dose defines the likelihood of occurrence of adverse effects. Doses less than the RfD are not likely to be associated with any adverse health effects and arc, generally, not of regulatory concern. Doses which exceed the RfD are considered to present the potential for adverse effects. Values associated with noncarcinogenic exposures are summed at the initial screening level. The relationship is expressed numerically using parameters known as the hazard value (HV) and hazard index (HI). The hazard value is obtained by dividing the average daily dose (ADD) by the RfD as presented below. The ADD is the estimated daily dose of a chemical associated with a situation-specific duration of exposure, which may not necessarily be an entire lifetime.

ADD / RfD = HV

Each dose calculation, or combination of chemical, receptor, and exposure pathway will have a distinct hazard value. The sum of the HVs for each receptor will yield the HI, as indicated:

$$HVi + HVii + HViii + .... = HI$$

An HI value of less than one indicates that an adverse effect would not be anticipated.

#### 3.3 BACKGROUND ON CARCINOGENIC RESPONSE

The U.S. EPA has typically required that chemicals which are carcinogenic be treated as if minimum thresholds do not exist (U.S. EPA, 1986a, 1986b). The dose-response curve for carcinogens used for regulatory purposes only allows for zero risk at zero dose. Thus, for all doses, some risk is assumed to be present. To estimate the theoretical response at environmental doses, various mathematical dose-response models are used. The accuracy of the projected risk at the low environmental doses is a function of how accurately the mathematical model reflects the relationship between dose and risk at the low dose levels. The U.S. EPA uses the linearized multistage model for low dose extrapolation (Munro and Krewski, 1981). This model assumes that the effect of the carcinogenic agent on tumor formation as seen at high doses in animal data is basically the same at low doses (i.e., the slope of the dose-response curve can be extrapolated downward to the origin in a linear manner).

The U.S. EPA applied the linearized multistage model, as recommended by the Carcinogen Risk Assessment Guidelines (U.S. EPA, 1986b), to develop the upperbound estimate of the risk for the chemicals considered carcinogenic. The numerical expression of carcinogenic potency of a chemical calculated by this method is known as the "Q star", written as  $Q_1^*$ . The  $Q_1^*$  usually represents the slope of a dose-response curve derived from animal studies, but may also be based on human epidemiology. The slope is the change in tumor incidence (Y axis) over the change in dose (X axis). Thus, the units in a  $Q_1^*$  value are tumor incidence over dose level, with dose (the denominator) in milligrams of chemical per kilogram of body weight-day  $(Q_1^* = (mg/kg-day)^{-1})$ .

#### 3.4 ESTIMATING THE LIKELIHOOD OF CARCINOGENIC RESPONSE

In order to estimate the theoretical excess lifetime carcinogenic risk associated with exposure to a chemical, the product of the medium-specific (ingestion, inhalation) carcinogenicity slope factor (CSF) and lifetime average daily dose (LADD) estimated for each exposure pathway of concern is determined. The calculation of the theoretical excess lifetime cancer risk is then:

LADD 
$$x CSF = Risk$$
.

#### 3.5 BENCHMARK VALUES FOR CHEMICALS OF CONCERN

The RfDs and CSFs and descriptions of the principal studies on which they are based are presented below for each of the chemicals of concern found at the site. These values are summarized in Table 3-1 and are based on the most recent U.S. EPA Integrated Risk Information System (IRIS) toxicity assessments (1992a). For MIBK, the values used for the reference doses are based on the Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) since the health risk assessment information contained in IRIS is not finalized.

Principal studies are those that contribute most significantly to the qualitative assessment. Principal studies are of two types: studies of human populations (epidemiologic investigations) and studies using laboratory animals. The presence of human data obviates the necessity of extrapolating from animals to humans. Therefore, human studies, when available, are given first priority. However, for most chemicals, there is a lack of appropriate information on effects in humans. In these cases, the principal studies are drawn from experiments on rats, mice or similar species.

#### ■ METHYLENE CHLORIDE

Methylene chloride has been classified by the U.S. EPA as a probable human carcinogen (Group B2). IRIS (U.S. EPA, 1992a) provides cancer potency estimates for both the oral and inhalation routes of exposure. IRIS also provides an oral reference dose for methylene chloride. The Health Effects Assessment Summary Tables (U.S. EPA, 1992b) provide an inhalation reference concentration.

#### -- Derivation of the Oral Cancer Slope Factor

IRIS presents the 10<sup>-6</sup> risk-specific dose of methylene chloride as 7.5 x 10<sup>-3</sup> (mg/kg-day)<sup>-1</sup>. Neither of the studies of chemical factory workers exposed to methylene chloride showed an excess of cancers (Ott et al., 1983; Friendlander et al., 1978; Hearne and Friendlander, 1981). The Ott et al. (1983) study was designed to examine cardiovascular effects, and consequently the study period was too short to allow for latency of site-specific cancers. The Friendlander et al. (1978) study was recently updated to include a larger cohort, followed through 1984, and an investigation of possible confounding factors (Hearne et al., 1986, 1987). A nonsignificant increase in pancreatic cancer deaths was reported. This was interpreted by U.S. EPA (1987) as neither clear evidence of carcinogenicity in humans, nor evidence of noncarcinogenicity. Lifetime exposure at high toxic doses in animal studies have indicated carcinogenic effects from both oral and inhalation exposure to methylene chloride (NCA, 1982, 1983). Two inhalation studies with methylene chloride have reported an increased incidence of benign mammary tumors in both sexes of Sprague-Dawley (Burek et al., 1984) and F344 (NTP, 1986a) rats. Male Sprague-Dawley rats were reported to have increased salivary gland sarcoma (Burek et al., 1984) and female F344 rats were reported to have increased leukemia incidence (NTP, 1986a).

#### -- Derivation of the Inhalation Cancer Slope Factor

IRIS presents the inhalation unit risk for methylene chloride as  $4.7 \times 10^{-7} \text{ ug/m}^3$ . Conversion of this factor to an inhalation cancer slope factor yields a value of  $1.6 \times 10^{-3} \text{ (mg/kg-day)}^{-1}$ . The slope factor was calculated assuming a 70 kg human body weight, 20 m<sup>3</sup> air inhaled per day and 100% absorption of inhaled methylene chloride.

A number of studies have been conducted to determine the potential for carcinogenicity of methylene chloride. The data are equivocal due to varying experimental design and quality, however a number of studies which were conducted for lifetime exposures at high doses have reported positive results (Burek et al., 1984; Dow Chemical Co., 1982).

#### -- Derivation of the Chronic Oral Reference Dose

The RfD for methylene chloride is  $6.0 \times 10^{-2}$  mg/kg-day (U.S. EPA, 1992a). This value was derived from a 24-month chronic toxicity and oncogenicity study of methylene chloride in rats.

The chosen study was conducted with 85 rats/sex at each of four nominal dose groups (i.e., 5, 50, 125 and 250 mg/kg-day) for 2 years. A high-dose recovery group of 25 rats/sex, as well as two control groups of 85 to 50 rats/sex, was also tested. Many effects were monitored. Treatment related histological alterations of the liver were evident at nominal doses of 50 mg/kg-day or higher. The low nominal dose of 5 mg/kg-day was chosen as the NOAEL (NCA, 1982).

#### Derivation of the Inhalation Reference Dose

HEAST (1992) lists a chronic reference concentration for methylene chloride of 3.0 mg/m<sup>2</sup> based on an inhalation study with rats. This concentration was converted to an inhalation reference dose of 0.86 mg/kg-day. This conversion assumes a 70 kg human body weight, 20 m<sup>2</sup> of air inhaled per day and 100% absorption of inhaled methylene chloride. This dose is based on a two year study in which rats were intermittently exposed to methylene chloride in air (Nitschke et al., 1988). The critical effect identified in this study was liver toxicity, and a NOAEL of 694.8 mg/m<sup>2</sup> was established.

#### ■ XYLENE

Xylene is not classified as a human carcinogen by the U.S. EPA. IRIS provides an oral reference dose for the evaluation of noncancer health effects.

#### -- Derivation of the Chronic Oral Reference Dose

IRIS (U.S. EPA 1992a) lists an oral reference dose for xylene (xylenes-mixed) as 2.0 mg/kg-day based on an animal study (NTP, 1986b).

Rats and mice were given gavage doses of 0, 250, or 500 mg/kg-day (rats) and 0, 500, or 1000 mg/kg-day (mice) 5 days/week for 103 weeks. The animals were observed for clinical signs of toxicity, body weight gain, and mortality. All animals that died or were killed at sacrifice were given gross necropsy and comprehensive histologic examinations. There was a dose-related increased mortality rate in male rats, and the increase was significantly greater only in the high-dose group as compared with controls. Many of the early deaths were caused by gavage error. There were no compound-related histopathologic lesions in any of the treated rats or mice. Therefore, the high dose was chosen as the LOAEL and the low dose a NOAEL.

IRIS (U.S. EPA, 1992a) does not list an inhalation reference dose for xylene (xylenes-mixed). An inhalation reference dose of 2.0 mg/kg-day was used in this assessment based on the oral reference dose.

#### **■** ETHYLBENZENE

Ethylbenzene is not classified as a carcinogen by the U.S. EPA (1992a). IRIS does provide an oral reference dose and inhalation reference concentration for the evaluation of noncancer health effects.

#### -- Derivation of the Chronic Oral Reference Dose

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for ethylbenzene as 1.0 x 10<sup>-1</sup> mg/kg-day based on a subchronic rat oral bioassay (Wolf et. al., 1986).

The chosen study was a rat 182-day oral bioassay in which ethylbenzene was given 5 days/week at doses of 13.6, 136, 408, or 680 mg/kg-day in olive oil gavage. The criteria considered in judging the toxic effects on the test animals were growth, mortality, appearance and behavior, hematologic findings, terminal concentration of urea nitrogen in the blood, final average organ and body weights, histopathologic findings, and bone marrow counts. The LOAEL of 408 mg/kg-day is associated with histopathologic changes in the liver and kidney.

#### -- Derivation of the Inhalation Reference Dose

IRIS lists a reference concentration for ethylbenzene as 1.0 mg/m³ based on animal inhalation studies. Conversion of this factor to an inhalation reference dose yields a value of 0.29 mg/kg-day. The RfD was calculated assuming a 70 kg human body weight, 20 m³ of air inhaled per day, and 100% absorption of inhaled ethylbenzene.

Inhalation reproductive toxicity studies were conducted with rats and rabbits exposed 6 to 7 hours/day, 7 days/week during days 1-19 and 1-24 of gestation, respectively, to nominal concentrations of 0, 100, or 1000 ppm (434 or 4342 mg/m³; Andrew and Bushbom, 1981). A separate group of rats was exposed pregestationally for 3 weeks prior to mating and exposure was continued into the gestational period. The results of the rabbit study led to the selection of a NOAEL of 100 ppm based on a lack of developmental effects in the animals.

#### ■ METHANOL

Methanol is not considered a carcinogenic chemical by the U.S. EPA (1992a). IRIS provides an oral reference dose for the evaluation of noncancer health effects.

#### -- Derivation of the Chronic Oral Reference Dose

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for methanol as 5.0 x 10<sup>-1</sup> mg/kg-day based on animal studies. IRIS does not list an inhalation reference dose for methanol. An inhalation reference dose of 5.0 x 10<sup>-1</sup> mg/kg-day was used in this risk assessment based on the oral reference dose.

The U.S. EPA Office of Solid Waste, under the RCRA Land Disposal Ban, sponsored the 90-day subchronic testing of methanol in rats (U.S. EPA, 1986c). Rats were gavaged daily with 0, 100, 500, or 2500 mg/kg-day of methanol. There were no differences between dosed animals and controls in body weight gain, food consumption, gross or microscopic evaluations. Elevated levels of SPGT, and increased, but not statistically significant, liver weights in both male and female rats suggest possible treatment-related effects in rats dosed with 2500 mg methanol/kg/day despite the absence of supportive histopathologic lesions in the liver. Based on these findings, 500 mg/kg-day of methanol was selected as a NOAEL in rats.

#### ■ TOLUENE

The U.S. EPA has not classified toluene as a human carcinogen. IRIS lists both an oral reference dose and inhalation reference concentration for this chemical.

#### Derivation of the Chronic Oral Reference Dose

IRIS (U.S. EPA, 1992a) lists an oral reference dose for toluene as 0.2 mg/kg-day based on a National Toxicology Program study (NTP, 1989).

A subchronic gavage study was conducted in rats. Rats received toluene in corn oil at dosage levels of 0, 312, 625, 1250, 2500, or 5000 mg/kg-day. The NOAEL for this study is 312 mg/kg-day based on liver and kidney weight changes in male rats at 625 mg/kg. Because the exposure was for 5 days/week, this dose is converted to  $312 \times 5/7 = 223$  mg/kg. The LOAEL is 625 mg/kg, which is 446 mg/kg-day when converted.

#### Derivation of the Inhalation Reference Dose

IRIS lists an inhalation reference concentration for toluene of 0.4 mg/m<sup>3</sup> based on an occupational study. Conversion of this concentration to an inhalation reference dose yields 0.11 mg/kg-day.

Foo et al. (1990) conducted a cross-sectional study involving 30 exposed female workers employed at an electronic assembly plant where toluene was emitted from glue. Toluene levels reported in the study were from personal monitoring. Exposed workers breathed toluene air levels of 88 ppm and control workers 13 ppm. Eight neurobehavioral tests were administered to all exposed and control workers. Group means revealed statistically significant differences in six out of eight tests; all tests showed that the exposed workers performed poorly compared with the control cohort. Based on the Foo study, a LOAEL of 88 ppm was established based on neurobiological changes from chronic exposure.

#### ■ METHYLISOBUTYL KETONE (MIBK)

#### -- Derivation of the Chronic Oral Reference Dose

The Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) list a chronic oral reference dose for methylisobutyl ketone as  $5.0 \times 10^{-2}$  mg/kg-day and an inhalation reference dose as  $2.0 \times 10^{-2}$  mg/kg-day. The oral and inhalation reference doses for MIBK are under review by an EPA work group. Therefore, health risk information contained in IRIS is not currently available. MIBK is not listed as a suspect or defined carcinogen in either IRIS or HEAST.

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TABLE 3-1
BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	(mg/kg-day) <sup>-1</sup>	(mg/kg-day) <sup>-1</sup>
Xylene	2.0 E+0	2.0 E+0 <sup>1</sup>	NA <sup>2</sup>	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	/8.6 E-Y	7.5 E-3	1.7 E-3

<sup>&</sup>lt;sup>1</sup> In the absence of an inhalation reference dose, the oral reference dose was used.

References:

U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

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<sup>&</sup>lt;sup>2</sup> NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

#### 4.0 EXPOSURE ASSESSMENT

Exposure assessment, as defined by the National Academy of Sciences (NAS, 1983), is the process of measuring or estimating the intensity, frequency, and duration of human exposure to an agent in the environment. "In its most complete form, exposure assessment should describe the magnitude, duration, schedule, and route of exposure; the size, nature, and classes of the populations exposed; and the uncertainties in all estimates" (NAS, 1983). Accordingly, this section of the risk assessment discusses the manner in which the chemicals of concern may be distributed in the environment and the estimated frequency of contact between potential human receptors and the chemicals. The quantitative assessment of exposure, based on the chemical concentrations present in the soil or other media of concern, and the degree of absorption of the chemical, provides the basis for estimating chemical uptake (dose) and associated health risks.

#### 4.1 CONCEPT OF DOSE

The "Average Daily Dose" (ADD) or "Lifetime Average Daily Dose" (LADD) of each chemical is the exposure parameter of concern for long-term exposure durations, such as might be considered to occur in the area surrounding the facility. The ADD typically characterizes exposures which are relatively long in duration, such as over a working lifetime. The ADD is used as a standard measure of duration for characterizing long-term noncarcinogenic effects, and does not necessarily incorporate a lifetime duration of exposure. The LADD addresses exposures which may occur over varying durations from a single event to an average 70-year human lifetime. The LADD is an estimate of the daily dose of a chemical associated with any particular exposure situation or duration. The LADD characterizes exposures associated with evaluations of the likelihood of occurrence of carcinogenic endpoints.

#### 4.2 EXPOSURE DOSE AND ABSORPTION

The ADD or LADD that would be received by the receptor is estimated from exposure and absorption. According to the U.S.EPA (1989), exposure is defined as contact of a receptor to a chemical or physical agent. The level of risk associated with exposure to a chemical is always dependent on the degree of systemic absorption or uptake (i.e., dose). Exposure, in this case, is the product of chemical concentrations and medium-specific factors. For example, in the case of inhalation, the medium-specific factor is air volume breathed. The LADD presents the average daily dose (considered absorbed according to U.S.EPA, 1989) of a chemical over the entire 70 year lifetime, considering the fraction of each duration unit, such as a day, week, month, or year. After calculation of the concentrations of the chemical in each medium, the LADD for each chemical received by the receptor due to each route of exposure is calculated.

#### 4.3 PATHWAYS AND ROUTES OF HUMAN EXPOSURE

Exposure pathways are the means through which a receptor may come into contact with a chemical in the environment (e.g., skin contact with soil containing chemicals). An exposure pathway consists of three elements: (1) a source or chemical release from a source, (2) an exposure point of potential human contact, and (3) an exposure route at the contact point. Routes of exposure describe the

Revision: 1 Date: February 18, 1993 means through which the chemical gains entry to the body via a particular pathway (e.g., dermal absorption of a soil-bound chemical). An exposure pathway is complete when all three elements are present. In this risk assessment, exposure pathways required by the OEPA are addressed quantitatively. These exceed the typically acceptable selection of exposure pathways. The following sections address the potential pathways and routes of human exposure.

## 4.4 RECEPTOR AND EXPOSURE PATHWAY SELECTION

The receptors required by OEPA were evaluated in each of the units. These include a residential adult and residential child. The exposure pathways evaluated for each of the receptors were, as required by OEPA, ingestion of soil, dermal contact with soil, inhalation of particulates, inhalation of volatiles, inhalation of volatiles during showering, ingestion of groundwater as drinking water and dermal contact with groundwater.

# 4.5 BASIS FOR EXPOSURE FACTORS

Exposure factors used in dose calculations are OEPA required values (OEPA, 1991). Details of the sources of exposure factors are presented below.

## 4.5.1 Factors Used in All Pathways

The following factors are consistent across the exposure pathways considered in this assessment. The values for the exposure duration and frequency for the pathways considered are as required by OEPA.

Exposure Frequency and Duration. The exposure frequency required by OEPA is 365 days for both an adult and child residential receptor. The exposure duration is 30 years for an adult residential receptor and 6 years for a child residential receptor (OEPA, 1991).

Body Weight. The value for average body weight of an adult is 70 kg and the value for average body weight of a child is 15 kg as required by OEPA (1991).

Averaging Time. The doses for noncarcinogenic health effects are averaged over the specific period of exposure for a given receptor. Noncarcinogenic averaging times are therefore calculated by multiplying the exposure frequency and exposure duration for the receptor. Noncarcinogenic averaging times for the adult and child respectively are 10,950 days and 2,190 days. Potential carcinogenic health effects are calculated over a lifetime of exposure; therefore, the OEPA (1991) value for average lifetime, 70 years, was used resulting in a carcinogenic averaging time of 25,550 days for both adult and child receptors.

# 4.5.2 Factors Regarding Soil Ingestion

The following factors are incorporated into the exposure calculations of the soil ingestion pathway, as shown in Table 4-1.

Soil Ingestion Rate. Exposure to chemicals in the local environment may typically occur through ingestion of soil. For the majority of persons beyond the age of six, daily uptake of soil due to

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ingestion will be quite low. For the purposes of estimating exposure in this risk assessment, the OEPA (1991) required value of 100 mg/day was used to describe soil ingestion for residential adults and 200 mg/day for residential children.

# 4.5.3 Factors Regarding Dermal Contact with Soil

The following factors are incorporated into the exposure calculations of the pathway involving dermal contact with site soils, as presented in Table 4-2.

Skin Surface Area. Skin surface area available for dermal contact with soil for all receptors is as required by OEPA for the scenario for outdoor activities. Exposed skin areas are the arms, hands, and legs for a total of 8,620 cm<sup>2</sup> of exposed skin surface area for a residential adult and 3,535 cm<sup>2</sup> for a residential child (OEPA, 1991).

Soil Adherence Factor. Numerous studies have evaluated the amount of soil that is likely to be in contact with skin. Roels et al. (1980) showed that approximately 1.0 mg of soil per square centimeter of skin adheres to a child's hand after playing in and around the home. Similarly, Driver et al. (1989) reported a reasonable maximum adherence factor of 0.9 mg/cm<sup>2</sup>. Despite these, the value used in this risk assessment for describing soil adherence to skin during dermal contact is 2.11 mg/cm<sup>2</sup> as required by OEPA (1991).

## 4.5.4 Factors Regarding Inhalation of Airborne Particles

The following factors are incorporated into the exposure calculations of the particulate inhalation pathway, as presented in Table 4-3.

<u>Inhalation Rate</u>. OEPA (1991) requires a daily inhalation rate of 20 m<sup>3</sup>/day for residential exposures. This gives an average inhalation rate of 0.83 m<sup>3</sup>/hour.

Exposure Time. OEPA (1991) requires that both adult and child residential exposures are 24 hours/day for 365 days per year.

# 4.5.5 <u>Factors Regarding Water Pathways</u>

The following factors are incorporated into the exposure calculations of groundwater ingestion (Table 4-4), and dermal contact with groundwater (Table 4-5).

Water Ingestion Rate. Following OEPA (1991) requirements, an adult residential receptor is assumed to ingest 2 liters of water per day and a residential child is assumed to ingest 1 liter of water per day.

Skin Surface Area. OEPA (1991) requires an average value of total body skin surface area of 18,150 cm<sup>2</sup> for residential adults and 7,195 cm<sup>2</sup> for residential children.

Exposure Time. OEPA (1991) requires an exposure time for dermal contact with chemicals in water as 0.008 hours per day.

# 4.5.6 Factors Regarding Inhalation of Volatiles During Showering

The following factors are incorporated into the exposure calculations of the inhalation of volatiles during showering or bathing, as presented in Table 4-6.

<u>Inhalation Rate</u>. OEPA (1991) requires a daily inhalation rate of 0.6 m<sup>3</sup>/hr for residential exposure during showering.

Exposure Time. OEPA requires (1991) a daily exposure time during showering of 0.2 hours/day.

# 4.5.7 Factors Regarding the Inhalation of Volatiles from Soil

The following factors are incorporated into the exposure calculations of the inhalation of volatiles from soils as presented in Table 4-7.

<u>Inhalation Rate</u>. Ohio EPA guidance (1991) provides a daily inhalation rate of 0.83 m<sup>3</sup>/hr for residential exposure.

Exposure Time. Ohio EPA guidance (1991) provide a daily exposure time of 24 hours/day.

#### 4.6 CHEMICAL ABSORPTION FACTORS

Chemicals which are contained in a soil matrix and which are contacted by a human receptor are generally not completely absorbed by the receptor. A certain portion of the chemical dose to which the receptor is exposed may not actually be bioavailable. Generally an absorption factor is applied to risk calculations to account for this. Absorption factors may be applicable for gastrointestinal, dermal and respiratory routes of contact. For dermal contact in particular, the amount of chemical actually absorbed through the skin is generally much less than the total chemical dose present in soil contacting the skin. Default absorption factors of 100% have been used for gastrointestinal and respiratory absorption in this risk assessment, even though in many cases, the actual values associated with these factors are far less than 1.0. For the purposes of dermal exposure to contaminated soil, absorption factors of 25% for volatile organic chemicals, 10% for semivolatile organic compounds, and 1% for inorganic compounds (Ryan et al., 1987) are used based on OEPA guidance (1991).

#### 4.7 DERMAL PERMEABILITY CONSTANTS

Pathways which involve dermal contact with water require the inclusion of a dermal permeability constant in the equation. This factor reflects the movement of the chemical from the water, across the skin, to the stratum corneum and into the bloodstream. Because permeability constants are based on equilibrium partitioning, they are likely to overestimate the absorbed dose of short exposure periods. Table 4-8 presents the dermal permeability constants used for the chemicals of concern in this risk assessment. The value for benzene, 0.1 cm/hr is considered representative of insoluble organic compounds and 1.5 x 10<sup>-3</sup> is considered representative for water-soluble inorganics or metals as required by OEPA (1991) although no specific literature citation is given. The value for benzene was used as the value for MIBK because no chemical-specific value was available.

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# 4.8 AIRBORNE PARTICULATE CONCENTRATIONS OF CHEMICALS

Receptors could be exposed through inhalation pathways to chemicals present in the air. This exposure could occur if chemicals contained in a soil matrix are inhaled as soil particulate emissions.

There are two physical phenomena which could produce soil particulate emissions at the site: wind erosion and mechanical disturbances. Wind erosion is typically considered the less significant of these two pathways and even during construction activities contributes only a minor portion to the total particulate emissions from a site (U.S. EPA, 1985). The analysis of potential air exposures assesses constituents migrating from the soils into the atmosphere. OEPA (1991) states that this demonstration should include emission calculations and "safe inhalation levels" based on U.S. EPA and OEPA established exposure levels.

In order to estimate the concentrations of airborne particulates present during construction or digging activities, a theoretical box model was utilized (U.S. EPA, 1973, 1974). The box model is a relatively simple approach which uses conservative assumptions designed to evaluate inhalation exposure to site-associated chemicals. The following conservative assumptions are incorporated into this model:

- The source is infinitely wide in the cross-wind direction;
- The receptor is in the source area at the downwind edge;
- Vertical dispersion has resulted in uniform mixing of the particles from the ground to the breathing zone; and
- No chemicals have dispersed higher than the breathing zone.

Air concentrations of particulates are calculated by assuming the particles enter a box which is the length of the downwind dimension of the area of concern and the height of an average person. The particles in this box are assumed to be uniformly distributed within it and displaced at the downwind end by fresh air moving at a speed WS (a conservative wind speed of 9000 meters/hr or 2.5 m/sec is considered for the assessment).

The box model estimates particle concentrations based on the following equation:

$$PB = GR \times L \times \frac{1}{WS} \times \frac{1}{H}$$

Where:

 $PB = Particle\ concentration\ in\ box\ (mg/m^3);$ 

GR = Particle generation rate  $(373 \text{ mg/m}^2\text{-hr})$ ;

L = Downwind length of contaminated area (area specific);

WS = Wind speed (9000 meters/hr); and

H = Height of box (2 meters)

The factors used in the box model calculation are presented in Table 4-9.

In order to calculate the concentration of a specific chemical in the air from the concentration of particulates, a highly conservative approach is incorporated that the concentration of a chemical contained in the airborne particles is the same as the concentration in area soils, as shown in the following equation:

Where:  $CA = Chemical concentration in airborne particulates <math>(mg/m^{\frac{1}{2}})$ 

PB = Particle concentration in box (mg/m<sup>2</sup>)

CS = Chemical concentration in soil (mg/kg)

CF = Conversion factor (10<sup>-6</sup> kg/mg)

Table 4-10 presents the concentration of chemicals in air as a result of particulate mobilization for each of the site areas.

## 4.9 GROUNDWATER CONCENTRATION OF CHEMICALS

OEPA (1991) states that levels of constituents in leachate may be estimated based on known characteristics of the constituents such as solubility and partitioning coefficients. A short-term, steady-state leaching model for organic chemicals was used to estimate the potential chemical concentrations in groundwater (Baes and Sharp, 1983). This model uses the following equation:

$$CW = \frac{C_s(o)h}{qt} \left[ 1 - \exp \left[ - \left[ \frac{qt}{hB \ K_{oc} f_{oc}} \right] \right] \right]$$

Where:

CW = Average concentration of the organic chemical leaving the soil in the leachate (ppm);

t = Duration of time interval of interest (seconds);

q = Infiltration rate of rain and snow melt (cm/sec);

h = Thickness of the soil in the unsaturated zone (cm);

 $C_{\epsilon}(0)$  = Initial concentration (time equals 0) of the organic chemical in the soil (mg/kg);

 $K_{oc}$  = Partition coefficient for the organic compound between water and organic carbon (ml/g);

 $f_{oc}$  = Fraction of soil that is composed of organic carbon (0.031-based on silty soil; Lyman et.al., 1982);

B = Soil bulk density  $(1.38 \text{ g/cm}^3 - \text{based on silty soil}; \text{ Morris and Johnson, 1967}).$ 

The long duration case is designed to address chronic or lifetime conditions. The long duration case determines the final concentration in the aquifer while the short duration case determines the concentration in leachate. Average aquifer concentrations for this model were determined over a year-long duration. The following equations describe the cases of short and long duration.

$$C_L = \frac{C_s}{B \ Koc \ foc}; \ and$$

$$C_w = \frac{C_h}{qt}$$
; which is described as

$$C_w = \frac{[C_L \times Q_S]}{[Q_S + Q_A]}$$

Where:

C<sub>w</sub> = Concentration in aquifer during a specified time (ppm);

C<sub>1</sub> = Concentration in leachate during a specified time (ppm);

 $Q_s$  = Volume of water infiltrating through the soil in one year calculated as the average annual precipitation (38.0 inches per year) minus the average annual runoff (13.0 inches per year; Gerahty, et. al., 1973) multiplied by the specific sampling point area (South Pad, 200 ft<sup>2</sup>; Incinerator Area, 90 ft<sup>2</sup>; West Pad, 50 ft<sup>2</sup>).

 $Q_A$  = Volume of water passing through the aquifer beneath the contaminant zone during one year, calculated by multiplying the cross-sectional area of the aquifer perpendicular to the groundwater flow direction by the groundwater flow velocity.

$$Q_A = (W \times h \times V)$$

Where:

W = Width of contaminated zone perpendicular to the flow direction (South Pad, 280 ft; Incinerator area, 120 ft; West Pad, 120 ft.).

h = thickness of the aquifer (20 ft);

V = Darcy velocity in the aquifer (V=Ci);

C = Hydraulic conductivity (1000 gallons per day per square foot; (Freeze and Cherry, 1979); and

i = Hydraulic gradient (0.00063 from Ohio area data; Geraghty et al., 1973).

This model reflects the behavior of organics in soils by assuming that chemicals originating in surface soils will migrate vertically from the point source of contamination down to the water table where the chemical will then be distributed throughout a particular zone. In this model, the size of the point

source area is assumed to be the size of the sampling grid and the contaminated zone is assumed to approximate the dimensions in each unit.

Each constituent has different chemical and physical properties that control the ultimate fate and transport of the chemical in soil. In general, where organics are released into unsaturated soils, they tend to migrate vertically under the force of gravity with some slight lateral spread (Schwendeman, 1989). This migration pathway may be interrupted by adsorption to soil particles, inhibition by geologic formations or by cultural features (pipe, foundations).

The subsurface transport of chemicals is also controlled by complex interactions between chemical, physical and biological processes. Some conditions that affect migration are:

- Soil texture;
- Soil uniformity or nonuniformity (i.e., layered soils are more likely to retard migration than uniform soils);
- Soil layer configuration;
- Depth to water table;
- Soil structure;
- Flow stability; and
- Soil moisture.

These fate and transport properties were applied to the aforementioned methodology to determine whether organic compounds tend to migrate to groundwater or remain adsorbed to soil particles. Table 4-11 presents the factors used for this leaching model and the predicted maximum concentration of organic chemicals in groundwater.

#### 4.10 CONCENTRATION OF CHEMICALS VOLATILIZING FROM SHOWER WATER

The maximum predicted concentration of volatiles that may be emitted from water during a typical shower was calculated using values of 50L of water used during showering, a shower stall volume of 2.5m<sup>3</sup> (Byard, 1989), 0.5 for a half-life of volatilization and a linear factor calculating average concentration. This calculation is presented in Table 4-12. Table 4-13 presents the concentration of volatiles in air as a result of showering using this predictive model.

# 4.11 SOIL-TO-AIR VOLATILIZATION MODEL

The volatilization factor model (VF) was used for defining the relationship between the concentration of chemicals in soil and the volatilized chemicals in air. This relationship was established as part of the Hwang and Falco (1986) model developed by EPA's Exposure Assessment Group (U.S. EPA, 1986d).

The VF presented in this section assumes that the chemical concentration in the soil is homogeneous from the soil surface to the depth of concern. This calculation is presented in Table 4-14. Factors incorporated into this model are presented in Table 4-15 and the concentration of volatile chemical emissions from soil predicted from this model are presented in Table 4-16.

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TABLE 4-1
INGESTION OF CHEMICALS IN SOIL

EXPOSURE FACTORS				
Symbol	Factor	Value -		
CS	Chemical Concentration in Soil	Area specific (mg/kg)		
IR	Ingestion Rate	100 mg/d - adult; 200 mg/d - child		
CF	Conversion Factor	10 <sup>-6</sup> kg/mg		
FI	Fraction Ingested	1.0 (unitless)		
EF	Exposure Frequency	365 days/year		
ED	Exposure Duration	30 yrs - adult; 6 yrs - child		
BW	Body Weight	70 kg - adult; 15 kg - child		
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)		

Calculation: Dose  $(mg/kg-day) = CS \times IR \times CF \times FI \times EF \times ED \times 1/BW \times 1/AT$ 

TABLE 4-2
DERMAL CONTACT WITH CHEMICALS IN SOIL

EXPOSURE FACTORS			
Symbol Factor Value		Value	
cs	Chemical Concentration in Soil	Area specific (mg/kg)	
CF	Conversion Factor	10 <sup>-6</sup> kg/mg	
SA	Skin Surface Area	8,620 cm <sup>2</sup> - adult; 3,535 cm <sup>2</sup> - child	
AF	Adherence Factor	2.11 mg/cm <sup>2</sup>	
ABS	Absorption Factor	Chemical Specific (unitless)	
EF	Exposure Frequency	365 days/year	
ED	Exposure Duration	30 yrs - adult; 6 yrs - child	
BW	Body Weight	70 kg - adult; 15 kg - child	
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)	

Calculation: Dose (mg/kg-day) = CS x CF x SA x ABS x AF x EF x ED x 1/BW x 1/AT

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For dermal exposure to chemicals in soil, chemical-specific values are 0.25 for volatile organic compounds, 0.1 for semi-volatile organic compounds, and 0.01 for inorganic compounds (OEPA, 1991; Ryan et. al., 1987).

TABLE 4-3
INHALATION OF CHEMICALS IN AIRBORNE PARTICULATES

EXPOSURE FACTORS			
Symbol Factor Val		Value	
CA	Chemical Concentration in Air	Calculated (mg/m <sup>3</sup> ) with Box Model (See 4.8)	
IR	Inhalation Rate	0.83 m <sup>3</sup> /hr	
ET	Exposure Time	24 hours/day	
EF	Exposure Frequency	365 days/year	
ED	Exposure Duration	30 yrs - adult; 6 yrs - child	
BW	Body Weight	70 kg - adult; 15 kg - child	
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)	

Calculation: Dose  $(mg/kg-day) = CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$ 

TABLE 4-4
INGESTION OF CHEMICALS IN DRINKING WATER

EXPOSURE FACTORS				
Symbol	Value			
CW	Chemical Concentration in Water	Calculated (mg/L) using Leachate Model (see 4.9)		
IR	Ingestion Rate	2 L/day - adult; 1 L/day - child		
EF	Exposure Frequency	365 days/year		
ED	Exposure Duration	30 yrs - adult; 6 yrs - child		
BW	Body Weight	70 kg - adult; 15 kg - child		
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)		

Calculation: Dose  $(mg/kg-day) = CW \times IR \times EF \times ED \times 1/BW \times 1/AT$ 

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TABLE 4-5
DERMAL CONTACT WITH CHEMICALS IN GROUNDWATER

	EXPOSURE FACTORS			
Symbol	Factor	Value		
CW	Chemical Concentration in Water	Calculated (mg/l) using Leachate Model (See 4.9)		
SA	Skin Surface Area	18,150 cm <sup>2</sup> - adult; 7,195 cm <sup>2</sup> - child		
PC	Dermal Permeability Constant	Chemical Specific 1		
ЕТ	Exposure Time	0.008 hours/day		
EF	Exposure Frequency	365 days/year		
ED	Exposure Duration	30 yrs - adult; 6 yrs - child		
CF	Conversion Factor	0.001 L/cm <sup>3</sup>		
BW	Body Weight	70 kg - adult; 15 kg - child		
АТ	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)		

Calculation: Dose (mg/kg-day) =  $CW \times SA \times PC \times ET \times EF \times ED \times CF \times 1/BW \times 1/AT$ 

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In the absence of chemical-specific dermal permeability constants from the open literature, Ohio EPA requires default values of 0.1 cm/hr for insoluble organic compounds and 1.5E-3 cm/hr for water-soluble inorganics or metals, (OEPA, 1991).

TABLE 4-6

# INHALATION OF AIRBORNE CHEMICALS DURING SHOWERING

EXPOSURE FACTORS			
Symbol	Symbol Factor Value		
CA	Chemical Concentration in Air	Calculated (mg/m <sup>3</sup> ) using Shower Model (see 4.10)	
IR	Inhalation Rate	0.6 m <sup>3</sup> /hr	
ЕТ	Exposure Time	0.2 hrs/day	
EF	Exposure Frequency	365 days/yr	
ED	Exposure Duration	30 yrs - adult; 6 yrs - child	
BW	Body Weight	70 kg - adult; 15 kg - child	
АТ	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)	

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose  $(mg/kg-day) = CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$ 

TABLE 4-7
INHALATION OF VOLATILE CHEMICALS FROM SOIL

EXPOSURE FACTORS			
Symbol Factor Value		Value	
CA	Chemical Concentration in Air	Calculated using Volatilization Model (see 4.14)	
IR	Inhalation Rate	0.833 m <sup>3</sup> /hr	
ET	Exposure Time	24 hrs/day	
EF	Exposure Frequency	365 days/yr	
ED	Exposure Duration	30 yrs - adult; 6 yrs - child	
BW	Body Weight	70 kg adult; 15 kg child	
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)	

Calculation: Dose  $(mg/kg-day) = CA \times IR \times ET \times EF \times ED \times 1/BW \times 1/AT$ 

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TABLE 4-8
DERMAL PERMEABILITY CONSTANTS

Chemical	Dermal Permeability Constant (Kp) (cm/hr)	
Xylene	3.16 E-04	
Ethylbenzene	4.47 E-01	
MIBK	1.00 E-01 <sup>1</sup>	
Toluene	1.70 E-01	
<sup>7</sup> Methanol	5.37 E-05	
Methylene Chloride	5.62 E-03	

All values are based on Flynn (1990).

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<sup>&</sup>lt;sup>1</sup> Based on a default value of 0.1 cm/hr for insoluble organic compounds (OEPA, 1991).

TABLE 4-9

# FACTORS USED IN THE BOX MODEL CALCULATION OF AIRBORNE PARTICULATE CONCENTRATIONS

Symbol	Factor	Value	Comments
GR	Particle Generation Rate	373 mg/m <sup>2</sup> hr	1.2 tons/mo/acre (U.S. EPA, 1985)
L	Length of Area	Incinerator Area = 30.5m South Pad = 85.3m West Pad = 36.6m	Refer to Figure 2-1
ws	Wind Speed	9000 m/hr	Conversion of 2.5 m/sec
Н	Height of Box	2m	Approximate height of a person

Particulate Concentration in Air = GR x L x 1/WS x 1/H

Chemical Concentration in Air (mg/m<sup>2</sup>) = Particulate Concentration (mg/m<sup>2</sup>) x Chemical Concentration in Soil (mg/kg) x  $10^{-6}$  kg/mg.

Example: Incinerator Area, Xylene

Particulate Concentration in  $Air = 373 \text{ mg/m}^2\text{div} \times 30.5 \text{ m/s} 1/9000 \text{ m/hr/s} 1/2 \text{ m} = 0.632 \text{ mg/m}^3$ 

Chemical Concentration in Air = 0.632 mg/m<sup>3</sup> x 4.0 mg/kg x  $10^{-6}$  kg/mg = 2.52 x  $10^{-6}$  mg/m<sup>3</sup>

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TABLE 4-10

CONCENTRATION OF CHEMICALS IN AIRBORNE PARTICULATES

Chemical	Concentration of Chemical in Soil (mg/kg)	Concentration of Chemical in Airborne Particulates (mg/m <sup>3</sup> )			
ncinerator Area					
Xylene	4.00	2.52 x 10 <sup>-6</sup>			
Ethylbenzene	2.00	1.27 x 10 <sup>-6</sup>			
Methylene Chloride	4.00	2.52 x 10 <sup>-6</sup>			
South Pad					
Xylene	8.00	1.41 x 10 <sup>-5</sup>			
Ethylbenzene	2.00	3.54 x 10 <sup>-6</sup>			
MIBK	0.006	1.06 x 10 <sup>-8</sup>			
Toluene	21.00	3.71 x 10 <sup>-5</sup>			
Methylene Chloride	3.00	5.30 x 10 <sup>-6</sup>			
West Pad					
Xylene	2.20	1.39 x 10 <sup>-6</sup>			
Ethylbenzene	0.229	1.45 x 10 <sup>-7</sup>			
Methanol	0.968	6.12 x 10 <sup>-7</sup>			
Toluene	1.34	8.47 x 10 <sup>-7</sup>			

Airborne particulate chemical concentrations calculated from the Box Model and soil concentrations; refer to Table 4-9.

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TABLE 4-11

MAXIMUM CONCENTRATION OF CHEMICALS PREDICTED IN GROUNDWATER

Chemical	Maximum Concentration Soil (mg/kg)	K <sub>oc</sub>	Predicted Maximum Concentrated in Groundwater (mg/l)	Maximum Concentration Limit (MCL) (mg/l)			
INCINERATOR ARE	INCINERATOR AREA						
Xylene	4.0	1,585	1.6 x 10 <sup>-4</sup>	10.0			
Ethylbenzene	2.0	257	5.1 x 10 <sup>-4</sup>	0.7			
Methylene Chloride	4.0	871	3.0 x 10 <sup>-4</sup>				
WEST PAD	.2						
Xylene	2.2	1,585	6.1 x 10 <sup>-5</sup>	10.0			
Ethylbenzene	0.229	257	4.0 x 10 <sup>-5</sup>	0.7			
Methanol	0.968	126	3.4 x 10 <sup>-4</sup>				
Toluene	1.34	151	3.9 x 10 <sup>-4</sup>	1.0			
SOUTH PAD							
Xylene	8.0	1,585	3.1 x 10 <sup>-4</sup>	10.0			
Ethylbenzene	2.0	257	4.8 x 10 <sup>-4</sup>	0.7			
мівк	0.006	372	8.4 x 10 <sup>-7</sup>				
Toluene	21.0	151	8.7 x 10 <sup>-3</sup>	1.0			
Methylene Chloride	3.0	871	2.1 x 10 <sup>-4</sup>				

 $K_{oc}$  values obtained from Montgomery and Welkom (1990).

TABLE 4-12
FACTORS USED IN THE CALCULATION OF VOLATILES IN AIR DURING SHOWERING

Symbol	Factor	Value	Comments
CA	Concentration in Air	Calculated (mg/m <sup>3</sup> )	See calculation below
CW	Concentration in Water	Calculated (ppm)	See Table 4-11
wv	Volume of water used during shower	50L	(Byard, 1989)
sv	Shower stall volume	2.5m <sup>3</sup>	(Byard, 1989)
HF	Half-life for volatilization	0.5	Assume volatilization half-life corresponds to length of shower (in minutes).
LF	Linear factor for calculating average concentration	0.5	Assumes initial concentration is O mg/m <sup>3</sup> and increases linearly with time. (0 + final air conc.)/2 = average

Calculation:  $CA = CW \times WV \times 1/SV \times HF \times LF$ 

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TABLE 4-13
CONCENTRATION OF VOLATILE CHEMICAL EMISSIONS DURING SHOWERING

Area and Chemical	Concentration in Groundwater (mg/l)	Vapor Concentration (mg/m <sup>3</sup> )
INCINERATOR AREA		
Xylene	1.6 x 10 <sup>-4</sup>	8.0 x 10 <sup>-4</sup>
Ethylbenzene	5.1 x 10 <sup>-4</sup>	2.6 x 10 <sup>-3</sup>
Methylene Chloride	3.0 x 10 <sup>-4</sup>	1.5 x 10 <sup>-3</sup>
SOUTH PAD		
Xylene	3.1 x 10 <sup>-4</sup>	1.6 x 10 <sup>-3</sup>
Ethylbenzene	4.8 x 10 <sup>-4</sup>	2.4 x 10 <sup>-3</sup>
MIBK	8.4 x 10 <sup>-7</sup>	4.2 x 10 <sup>-6</sup>
Toluene	8.7 x 10 <sup>-3</sup>	4.4 x 10 <sup>-2</sup>
Methylene Chloride	2.1 x 10 <sup>-4</sup>	1.1 x 10 <sup>-3</sup>
WEST PAD		
Xylene	6.1 x 10 <sup>-5</sup>	3.1 x 10 <sup>-4</sup>
Ethylbenzene	3.9 x 10 <sup>-5</sup>	2.0 x 10 <sup>-4</sup>
Methanol	3.4 x 10 <sup>-4</sup>	1.7 x 10 <sup>-3</sup>
Toluene	3.9 x 10 <sup>-4</sup>	2.0 x 10 <sup>-3</sup>

TABLE 4-14
SOIL-TO-AIR VOLATILIZATION MODEL CALCULATION

Symbol	Factor (Units)	Value
VF	volatilization factor (m <sup>3</sup> /kg)	Chemical and Site Specific
LS	length of side of contaminated area (m)	Incinerator Area = 30.5m; South Pad = 85.3m; West Pad = 36.6m;
( v	wind speed in mixing zone (m/sec)	2.5 m/sec
DH	diffusion height (m)	2 m
A	area of contamination (cm <sup>2</sup> )	Incinerator Area = $11,152,416 \text{ cm}^2$ , South Pad = $31,226,766 \text{ cm}^2$ , West Pad = $2,788,104 \text{ cm}^2$ ,
$D_{ai}$	effective diffusivity (cm <sup>2</sup> /sec)	$D_{i} x E^{0.33}$
D <sub>ei</sub> E	true soil porosity (unitless)	0.35
K <sub>as</sub>	soil/air partition coefficient (g soil/cm <sup>3</sup> air)	(H/K <sub>d</sub> ) x 41, where 41 is a units conversion factor
P <sub>s</sub>	true soil density or particulate density (g/cm <sup>3</sup> )	2.65 g/cm <sup>3</sup>
Т	exposure interval (sec)	$7.9 \times 10^8 \text{ sec}$
D <sub>i</sub>	molecular diffusivity (cm <sup>2</sup> /sec)	chemical-specific
H'	Henry's law constant (atm-m <sup>3</sup> /mol)	chemical-specific
K <sub>d</sub>	soil-water partition coefficient (cm <sup>3</sup> /g)	chemical-specific
K <sub>∞</sub>	organic carbon partition coefficient (cm <sup>3</sup> /g)	chemical-specific
oĉ	organic carbon content of soil (fraction)	0.031 - Lyman, 1983

Values for E and P<sub>s</sub> are from EPA 1988a, and EPA 1988b.

#### Calculation:

VF (m<sup>3</sup>/kg) = 
$$\frac{\text{(LS x V x DH)}}{A}$$
 x  $\frac{(3.14 \text{ x } \alpha \text{ x T})^{1/2}}{(2 \text{ x D}_{ei} \text{ x E x K}_{as} \text{ x } 10^{-3} \text{ kg/g})}$ 

where:

$$\alpha (cm^{2}/s) = \frac{(D_{ei} \times E)}{E + (P_{s})(1-E)/K_{as}}$$

CHEMICAL-SPECIFIC VALUES INCORPORATED INTO THE SOIL-TO-AIR VOLATILIZATION MODEL

**TABLE 4-15** 

Chemical	$D_i$	Н	K <sub>d</sub>	K <sub>oc</sub>	D <sub>ei</sub>	K <sub>as</sub>	α
Toluene	4.2E-05	0.0067	4.681	151	3.0E-05	0.059	3.6E-07
Ethylbenzene	1.5E-06	0.0066	7.967	257	1.0E-06	0.034	7.0E-09
Xylene	5.5E-05	0.0053	49.135	1585	3.8E-05	0.004	3.1E-08
Methanol	1.3E-05	0.0076	3.906	126	8.9E-06	0.080	1.4E-07
MIBK	2.5E-06	0.0043	11.532	372	1.7E-06	0.015	5.3E-09
Methylene Chloride	1.1E-06	0.0020	27.001	871	7.9E-07	0.003	4.8E-10

Factors obtained from Lyman et.al., (1982) <u>Handbook of Chemical Properties</u>; CRC (1990) <u>Handbook of Chemistry and Physics</u>; Perry (1990) <u>Chemical Engineers</u> <u>Handbook</u>; Montgomery and Welkom (1990) <u>Groundwater Chemicals Desk Reference</u>.

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TABLE 4-16
CONCENTRATION OF VOLATILE CHEMICAL EMISSIONS FROM SOIL

AREA & CHEMICAL	CONCENTRATION IN	VAPOR CONCENTRATION
	SOIL (mg/kg)	$(mg/m^3)$
Incinerator Area		
Xylene	4.0	3.0 x 10 <sup>-6</sup>
Ethylbenzene	2.0	7.1 x 10 <sup>-7</sup>
Methylene Chloride	4.0	3.7 x 10 <sup>-7</sup>
South Pad		
Xylene	8.0	7.2 x 10 <sup>-6</sup>
Ethylbenzene	2.0	8.5 x 10 <sup>-7</sup>
MIBK	0.006	1.8 x 10 <sup>-9</sup>
Toluene	21.0	6.4 x 10 <sup>-5</sup>
Methylene Chloride	3.0	3.3 x 10 <sup>-7</sup>
West Pad		
Xylene	2.2	4.9 x 10 <sup>-7</sup>
Ethylbenzene	0.229	2.4 x 10 <sup>-8</sup>
Methanol	0.968	$4.7 \times 10^{-7}$
Toluene	1.34	1.0 x 10 <sup>-6</sup>

#### 5.0 RISK CHARACTERIZATION

Risk characterization is the description of the nature and the magnitude of the potential for occurrence of adverse health effects under a specific set of conditions. In this section the criteria identified in the dose-response assessment (Section 3) are compared with the uptake (dose) values presented in the exposure assessment (Section 4).

The toxicity and exposure assessments are summarized and integrated into quantitative expressions of risk. To characterize potential noncarcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. To characterize potential carcinogenic effects, the theoretical probability that an individual will develop cancer over a lifetime of exposure is estimated from conservative projected intakes and chemical-specific dose-response information. The purpose of risk characterization is to present the data that provide a conclusion with regard to the nature and extent of the risk. This section presents a discussion of the risks calculated for each of the three units.

#### 5.1 APPROACH

For each exposure pathway, theoretical excess lifetime cancer risks were calculated for chemicals of concern which are considered carcinogens by the U.S. EPA (methylene chloride). Hazard values were calculated for all of the chemicals which could potentially pose noncarcinogenic hazards: xylene, ethylbenzene, MIBK, toluene, methanol, and methylene chloride. The noncancer hazard value is based on the assumption that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. The individual theoretical excess cancer risk assumes a lifetime of exposure to putative carcinogens.

According to OEPA guidance (1991), carcinogens detected at the site must not exceed the upperbound cancer probability of 1 x 10<sup>-6</sup> (one chance in one million for a theoretical extra case of cancer). For summed noncarcinogens detected at the site, the total exposure hazard index is required to be below unity. As required by OEPA, calculated risks were added between hazardous constituents and summed across all routes of exposure for each unit.

# 5.2 RISK CHARACTERIZATION FOR RECEPTORS AND AREAS OF CONCERN

The results of the risk characterization for each unit are presented below.

The health effects calculation tables are organized in the following manner:

- Tables are in numerical order corresponding to area of concern and receptor as follows: Former Liquid Waste Incineration Area, South Pad and West Pad, residential adult, residential child.
- Tables are also in numerical order corresponding to specific pathway as follows: ingestion of groundwater, dermal contact with groundwater, ingestion of soil, dermal contact with soil, inhalation of particulates, inhalation of volatiles from showering, inhalation of volatiles from soil, and combined hazard index and lifetime cancer risks.

# 5.3 SUMMARY OF POTENTIAL FOR ADVERSE EFFECTS

Table 5-1 presents the summed hazard indices and theoretical excess cancer risks associated with each of the receptors for each unit. Tables 5-2 through 5-7 present the noncancer hazard indices and theoretical excess lifetime cancer risks associated with each exposure pathway and each chemical by unit.

#### **Incinerator Area**

Tables 5-8 through 5-15 present the likelihood of adverse effects associated with the residential adult for this area and Tables 5-16 through 5-23 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1 x 10<sup>-6</sup> designated by OEPA (1991) for RCRA closure. For both receptors, the combined hazard index values are lower than the acceptable benchmark of one designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the incinerator area indicate that the summed theoretical excess lifetime cancer risks are  $8.83 \times 10^{-7}$  for the adult and  $3.69 \times 10^{-7}$  for the child. The combined hazard index values are  $6.26 \times 10^{-2}$  and  $1.32 \times 10^{-2}$  for the adult and child, respectively.

# South Pad

Tables 5-24 through 5-31 present the likelihood of adverse effects associated with residential adult for this area and Tables 5-32 through 5-39 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1 x 10<sup>-6</sup> designated by OEPA (1991) for RCRA closure. For both receptors, the summed hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the South Pad area indicate that the summed theoretical excess lifetime cancer risks are  $6.62 \times 10^{-7}$  for adult and  $2.77 \times 10^{-7}$  for the child. The combined hazard index values are  $1.43 \times 10^{-2}$  for the adult and  $3.22 \times 10^{-2}$  for the child.

#### West Pad

Tables 5-40 through 5-47 present the likelihood of adverse effects associated with the residential adult and Tables 5-48 through 5-55 present the likelihood of adverse effects associated with a residential child.

Theoretical excess lifetime cancer risks were not calculated for this area, since the chemicals of concern were not putative carcinogens. For both receptors the combined hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991). The results for the West Pad area indicate that the combined hazard index values are 8.52 x 10<sup>-4</sup> for the adult and 1.91 x 10<sup>-3</sup> for the child.

SUMMARY OF COMBINED HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS

TABLE 5-1

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks		
Adult/Incinerator Area	6.26 E-03	8.83 E-07		
Child/Incinerator Area	1.32 E-02	3.69 E-07		
Adult/South Pad	1.43 E-02	6.62 E-07		
Child/South Pad	3.22 E-02	2.77 E-07		
Adult/West Pad	8.52 E-04	NA		
Child/West Pad	1.91 E-03	NA		

NA - No putitive carcinogenic chemicals detected in this area

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TABLE 5-2

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE INCINERATOR AREA

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks	
Xylene	Adult	1.36E-04	0.00E+00	
	Child	2.86E-04	0.00E+00	
Ethylbenzene	Adult	1.50E-03	0.00E+00	
. <del>.</del>	Child	3.18E-03	0.00E+00	
Methylene Chloride	Adult	4.63E-03	8.83E-07	
	Child	9.78E-03	3.69E-07	

TABLE 5-3

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE INCINERATOR AREA

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks	
Ingestion of Chemicals in	Adult	2.91E-04	2.76E-08	
Groundwater	Child	6.79E-04	1.29E-08	
Dermal Contact with	Adult	4.79E-06	1.12E-11	
Chemicals in Groundwater	Child	8.86E-06	4.16E-12	
Ingestion of Chemicals in	Adult	1.27E-04	1.84E-08	
Soil	Child	1.18E-03	3.43E-08	
Dermal Contact with	Adult	5.76E-03	8.35E-07	
Chemicals in Soil	Child	1.10E-02	8.00E-07	
Inhalation of Chemicals	Adult	1.63E-05	5.92E-10	
on Airborne Particulates	Child	7.61E-05	5.53E-10	
Inhalation of Chemicals	Adult	5.89E-05	1.76E-09	
from Vapor While Showering	Child	2.75E-04	1.65E-09	
Inhalation of Chemicals	Adult	2.89E-06	7.25E-11	
from Vapors from Soil	Child	1.34E-05	6.76E-11	

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TABLE 5-4

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE SOUTH PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks	
Xylene	Adult	2.73E-04	0.00E+00	
	Child	5.77E-04	0.00E+00	
Ethylbenzene	Adult	1.49E-03	0.00E+00	
	Child	3.16E-03	0.00E+00	
MIBK	Adult	8.96E-06	0.00E+00	
	Child	2.00E-05	0.00E+00	
Toluene	Adult	9.01E-03	0.00E+00	
	Child	2.10E-02	0.00E+00	
Methylene Chloride	Adult	3.48E-03	6.62E-07	
	Child	7.38E-03	2.77E-07	

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TABLE 5-5

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE SOUTH PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks		
Ingestion of Chemicals	Adult	1.48E-03	1.93E-08		
in Groundwater	Child	3.46E-03	9.00E-09		
Dermal Contact with	Adult	1.98E-05	7.87E-12		
Chemicals in Groundwater	Child	3.67E-05	2.91E-12		
Ingestion of Chemicals in Soil	Adult	2.56E-04	1.38E-08		
	Child	2.39E-03	2.57E-08		
Dermal Contact with Chemicals in Soil	Adult	1.16E-02	6.26E-07		
	Child	2.23E-02	2.40E-07		
Inhalation of Chemicals	Adult	1.27E-04	1.03E-09		
on Airborne Particulates	Child	5.92E-04	9.66E-10		
Inhalation of Chemicals	Adult	7.33E-04	1.29E-09		
from Vapors While Showering	Child	3.42E-03	1.21E-09		
Inhalation of Chemicals	Adult	1.69E-04	6.52E-11		
from Vapors from Soil	Child	7.87E-04	6.09E-11		

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TABLE 5-6

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE WEST PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Xylene	Adult	7.44E-05	0.00E+00
	Child	1.56E-04	0.00E+00
Ethylbenzene	Adult	1.65E-04	0.00E+00
	Child	3.48E-04	0.00E+00
Methanol	Adult	7.87E-05	0.00E+00
	Child	1.96E-04	0.00E+00
Toluene	Adult	5.35E-04	0.00E+00
	Child	1.21E-03	0.00E+00

TABLE 5-7

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE WEST PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks	
Ingestion of Chemicals	Adult	8.72E-05	0.00E+00	
in Groundwater	Child	2.03E-04	0.00E+00	
Dermal Contact with	Adult	1.05E-06	0.00E+00	
Chemicals in Groundwater	Child	1.94E-06	0.00E+00	
Ingestion of Chemicals in Soil	Adult	1.72E-05	0.00E+00	
	Child	1.60E-04	0.00E+00	
Dermal Contact with	Adult	7.06E-04	0.00E+00	
Chemicals in Soil	Child	1.35E-03	0.00E+00	
Inhalation of Chemicals	Adult	2.88E-06	0.00E+00	
on Airborne Particulates	Child	1.34E-05	0.00E+00	
Inhalation of Chemicals	Adult	3.84E-05	0.00E+00	
from Vapors While Showering	Child	1.79E-04	0.00E+00	
Inhalation of Chemicals	Adult	3.01E-06	0.00E+00	
from Vapors from Soil	Child	1.40E-05	0.00E+00	

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Residential Adult Incinerator Area Table 5-8

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/1)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-04	4.57E-06	2.00E+00	2.29E-06	1.96E-06	NA	
Ethylbenzene	100-41-4	5.10E-04	1.46E-05	1.00E-01	1.46E-04	6.24E-06	NA	
Methylene Chloride	75-09-2	3.00E-04	8.57E-06	6.00E-02	1.43E-04	3.67E-06	7.50E-03	2.76E-08
Summed:					2.91E-04			2.76E-08
				4				

Residential Adult Incinerator Area Table 5-9

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	1.60E-04 5,10E-04 3.00E-04	1.05E-10 4.73E-07 3.50E-09	2.00E+00 1.00E-01 6.00E-02	5.24E-11 4.73E-06 5.83E-08	4.49E-11 2.03E-07 1.50E-09	NA NA 7.50E-03	  1.12E-11
Summed:					4.79E-06			1.12E-11

Residential Adult Incinerator Area

Table 5-10

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	5.71E-06 2.86E-06 5.71E-06	2.00E+00 1.00E-01 6.00E-02	2.86E-06 2.86E-05 9.52E-05	2.45E-06 1.22E-06 2.45E-06	NA NA 7.50E-03	  1.84E-08
Summed:					1.27E-04			1.84E-08

Residential Adult Incinerator Area

Table 5-11

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	2.60E-04 1.30E-04 2.60E-04	2.00E+00 1.00E-01 6.00E-02	1.30E-04 1.30E-03 4.33E-03	1.11E-04 5.57E-05 1.11E-04	NA NA 7.50E-03	  8.35E-07
Summed:					5.76E-03			8.35E-07

Residential Adult Incinerator Area

Table 5-12

#### Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	3.03E-06 1.52E-06 3.03E-06	8.63E-07 4.32E-07 8.63E-07	2.00E+00 2.90E-01 6.00E-02	4.32E-07 1.49E-06 1.44E-05	3.70E-07 1.85E-07 3.70E-07	NA NA 1.60E-03	5. 92E-10
Summed:						1.63E-05			5.92E-10

Residential Adult Incinerator Area

Table 5-13

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	8,00E-04 2,60E-03 1,50E-03	1,37E-06 4,46E-06 2,57E-06	2.00E+00 2.90E-01 6.00E-02	6.86E-07 1.54E-05 4.29E-05	5.88E-07 1.91E-06 1.10E-06	NA NA 1.60E-03	  1.76E-09
Summed:					5.89E-05			1.76E-09

Residential Adult Incinerator Area

Table 5-14

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.00E-06	8.57E-07	2.00E+00	4.28E-07	3.67E-07	NA	
Ethylbenzene Methylene Chloride	100-41 <b>-</b> 4 75-09-2	7.10E-07 3.70E-07	2.03E-07 1.06E-07	2.90E-01 6.00E-02	6.99E-07 1.76E-06	8.69E-08 4.53E-08	NA 1.60E-03	7.25E-11
Summed:					2.89E-06			7.25E-11

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Table 5-15

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.36E-04	0.00E+00
Ethylbenzene	100-41-4	1.50E-03	0.00E+00
Methylene Chloride	75-09-2	4.63E-03	8.83E-07
Summed:		6.26E-03	8.83E-07

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Residential Child Incinerator Area

Table 5-16

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/1)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	1.60E-04 5.10E-04 3.00E-04	1.07E-05 3.40E-05 2.00E-05	2.00E+00 1.00E-01 6.00E-02	5.33E-06 3.40E-04 3.33E-04	9.14E-07 2.91E-06 1.71E-06	NA NA 7.50E-03	  1.29E-08
Summed:					6.79E-04			1.29E-08

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Table 5-17

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	1.60E-04 5.10E-04 3.00E-04	1.94E-10 8.75E-07 6.47E-09	2.00E+00 1.00E-01 6.00E-02	9.70E-11 8.75E-06 1.08E-07	1.66E-11 7.50E-08 5.55E-10	NA NA 7.50E-03	  4 . 16E-12
Summed:					8.86E-06			4.16E-12

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Residential Child Incinerator Area

Table 5-18

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	5.33E-05 2.67E-05 5.33E-05	2.00E+00 1.00E-01 6.00E-02	2.67E-05 2.67E-04 8.89E-04	4.57E-06 2.29E-06 4.57E-06	NA NA 7.50E-03	  3,43E-08
Summed:					1.18E-03			3.43E-08

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Table 5-19

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)~1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	4.97E-04 2.49E-04 4.97E-04	2.00E+00 1.00E-01 6.00E-02	2.49E-04 2.49E-03 8.29E-03	4.26E-05 2.13E-05 4.26E-05	NA NA 7.50E-03	3.20E-07
Summed:					1.10E-02			3.20E-07

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Table 5-20

# Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	4.00E+00 2.00E+00 4.00E+00	3.03E-06 1.52E-06 3.03E-06	4.03E-06 2.01E-06 4.03E-06	2.00E+00 2.90E-01 6.00E-02	2.01E-06 6.95E-06 6.71E-05	3.45E-07 1.73E-07 3.45E-07	NA NA 1.60E-03	  5.53E-10
Summed:						7.61E-05			5.53E-10

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Table 5-21

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	8.00E~04 2.60E-03 1.50E-03	6.40E-06 2.08E-05 1.20E-05	2.00E+00 2.90E-01 6.00E-02	3.20E-06 7.17E-05 2.00E-04	5.49E-07 1.78E-06 1.03E-06	NA NA 1.60E-03	  1.65E-09
Summed:					2.75E-04			1.65E-09

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Table 5-22

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene Ethylbenzene Methylene Chloride	1330-20-7 100-41-4 75-09-2	3.00E-06 7.10E-07 3.70E-07	3.98E-06 9.43E-07 4.91E-07	2.00E+00 2.90E-01 6.00E-02	1.99E-06 3.25E-06 8.19E-06	3.41E-07 8.08E-08 4.21E-08	NA NA 1.60E-03	  6.74E-11
Summed:					1.34E-05			6.74E-11

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Residential Child Incinerator Area Table 5-23

# Combined Hazard Index and Lifetime Cancer Risks

CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
1330-20-7	2.86E-04	0.00E+00
100-41-4	3.18E-03	0.00E+00
75-09-2	9.78E-03	3.69E-07
	1.32E-02	3.69E-07
	1330-20-7 100-41-4	CAS No. Hazard Index  1330-20-7 2.86E-04 100-41-4 3.18E-03 75-09-2 9.78E-03

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Table 5-24

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	8.86E-06	2.00E+00	4.43E-06	3.80E-06	NA	
Ethylbenzene	100-41-4	4.80E-04	1.37E-05	1.00E-01	1.37E-04	5.88E-06	NA	
MIBK	95-50-1	8.40E-07	2.40E-08	5.00E-02	4.80E-07	1.03E-08	NA	
Toluene	108-88-3	8.70E-03	2.49E-04	2.00E-01	1.24E-03	1.07E-04	NA	
Methylene Chloride	75-09-2	2.10E-04	6.00E-06	6.00E-02	1.00E-04	2.57E-06	7.50E-03	1.93E-08
Summed:					1.48E-03			1.93E-08

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Table 5-25

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/1)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	2.03E-10	2.00E+00	1.02E-10	8.71E~11	NA	
Ethylbenzene	100-41-4	4.80E-04	4.45E-07	1.00E-01	4.45E-06	1.91E-07	NA	
MIBK	95-50-1	8.40E-07	1.74E-10	5.00E-02	3.48E-09	7.47E-11	NA	
Toluene	108-88-3	8.70E-03	3.07E-06	2.00E-01	1.53E-05	1,31E-06	NA	
Methylene Chloride	75-09-2	2.10E-04	2.45E-09	6.00E-02	4.08E-08	1.05E-09	7.50E-03	7.87E-12
Summed:					1.98E-05			7.87E-12

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Table 5-26

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.14E-05	2.00E+00	5.71E-06	4.90E-06	NA.	
Ethylbenzene	100-41-4	2.00E+00	2.86E-06	1.00E-01	2.86E-05	1.22E-06	NA	
MIBK	95-50-1	6.00E-03	8.57E-09	5.00E-02	1.71E-07	3.67E-09	NA	
Toluene	108-88-3	2.10E+01	3.00E-05	2.00E-01	1.50E-04	1.29E-05	NA	
Methylene Chloride	75-09-2	3.00E+00	4.29E-06	6.00E-02	7.14E-05	1.84E-06	7.50E-03	1.38E-08
Summed:					2.56E-04			1.38E-08

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Table 5-27

Dermal Contact with Chemicals in Soil

CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
1330-20-7	8.00E+00	5.20E-04	2.00E+00	2.60E-04	2.23E-04	NA	<del></del>
100-41-4	2.00E+00	1.30E-04	1.00E-01	1.30E-03	5.57E-05	NA	
95-50-1	6.00E-03	3.90E-07	5.00E-02	7.79E-06	1.67E-07	NA	
108-88-3	2.10E+01	1.36E-03	2.00E-01	6.82E-03	5.85E-04	NA	
75-09-2	3.00E+00	1.95E-04	6.00E-02	3.25E-03	8.35E-05	7.50E-03	6.26E-07
				1.16E-02			6.26E-07
	1330-20-7 100-41-4 95-50-1 108-88-3	CAS No. Concentration (mg/kg)  1330-20-7 8.00E+00 100-41-4 2.00E+00 95-50-1 6.00E-03 108-88-3 2.10E+01	CAS No. Concentration (mg/kg) Daily Dose (mg/kg/day)  1330-20-7 8.00E+00 5.20E-04 100-41-4 2.00E+00 1.30E-04 95-50-1 6.00E-03 3.90E-07 108-88-3 2.10E+01 1.36E-03	Soil Average Dose CAS No. (mg/kg) (mg/kg/day) Reference Dose (mg/kg) (mg/kg/day) (mg/kg/day)  1330-20-7 8.00E+00 5.20E-04 2.00E+00 100-41-4 2.00E+00 1.30E-04 1.00E-01 95-50-1 6.00E-03 3.90E-07 5.00E-02 108-88-3 2.10E+01 1.36E-03 2.00E-01	Soil Average Dose Hazard Concentration (mg/kg) Concentration (mg/kg/day) Concentration Daily Dose (mg/kg/day) Value  1330-20-7 8.00E+00 5.20E-04 2.00E+00 2.60E-04 100-41-4 2.00E+00 1.30E-04 1.00E-01 1.30E-03 95-50-1 6.00E-03 3.90E-07 5.00E-02 7.79E-06 108-88-3 2.10E+01 1.36E-03 2.00E-01 6.82E-03 75-09-2 3.00E+00 1.95E-04 6.00E-02 3.25E-03	Soil Average Dose Dose Hazard Daily Dose (mg/kg/day) Value Dose (mg/kg/day)  1330-20-7 8.00E+00 5.20E-04 2.00E+00 2.60E-04 2.23E-04 100-41-4 2.00E+00 1.30E-04 1.00E-01 1.30E-03 5.57E-05 95-50-1 6.00E-03 3.90E-07 5.00E-02 7.79E-06 1.67E-07 108-88-3 2.10E+01 1.36E-03 2.00E-01 6.82E-03 5.85E-04 75-09-2 3.00E+00 1.95E-04 6.00E-02 3.25E-03 8.35E-05	Soil Average Daily Dose (mg/kg/day) Reference Dose Hazard Value (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (mg/kg/day) Part Dose (m

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Table 5-28

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Mad and	1000 00 7		4 447 05		0.007100	0.017.04	1 707 07	57.4	
Xylene	1330-20-7	8.00E+00	1.41E-05	4.02E-06	2.00E+00	2.01E-06	1.72E-06	NA	
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	1.01E-06	2.90E-01	3.47E-06	4.31E-07	NA	
MIBK	95-50-1	6.00E-03	1.06E-08	3.02E-09	2.00E-02	1.51E-07	1.29E-09	NA	
Toluene	108-88-3	2.10E+01	3.71E-05	1.06E-05	1.10E-01	9.60E-05	4.53E-06	na	
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	1.51E-06	6.00E-02	2.52E-05	6.47E-07	1.60E-03	1.03E-09
Summed:						1.27E-04			1.03E-09

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Table 5-29

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
	····· - ·· ·				• • •			
Xylene	1330-20-7	1,60E-03	2.74E-06	2.00E+00	1.37E-06	1.18E-06	NA	
Ethylbenzene	100-41-4	2.40E-03	4.11E-06	2.90E-01	1.42E-05	1.76E-06	NA	
MIBK	95-50-1	4.20E-06	7.20E-09	2.00E-02	3.60E-07	3.09E-09	NA	
Toluene	108-88-3	4.40E-02	7.54E-05	1.10E-01	6.86E-04	3.23E-05	NA.	
Methylene Chloride	75-09-2	· 1.10E-03	1.89E-06	6.00E-02	3.14E-05	8.08E-07	1.60E-03	1.29E-09
Summed:					7.33E-04			1.29E-09

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Table 5-30

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	2.04E-06	2.00E+00	1.02E-06	8.74E-07	NA	
Ethylbenzene	100-41-4	8.48E-07	2.42E-07	2.90E-01	8.35E-07	1.04E-07	NA	
MIBK	95-50-1	1.83E-09	5.23E-10	2.00E-02	2.61E-08	2.24E-10	NA	
Toluene	108-88-3	6.36E-05	1.82E-05	1.10E-01	1.65E-04	7.78E-06	NA	
Methylene Chloride	75-09-2	3.33E-07	9.51E-08	6.00E-02	1.59E-06	4.08E-08	1.60E-03	6.52E-11
Summed:					1.69E-04			6.52E-11

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Table 5-31

# Combined Bazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hezard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.73E-04	0.00E+00
Ethylbenzene	100-41-4	1.49E-03	0.00E+00
MIBK	95-50-1	8.96E-06	0.00E+00
Toluene	108-88-3	9.01E-03	0.00E+00
Methylene Chloride	75-09-2	3.48E-03	6.62E-07
Summed:		1.43E-02	6.62E-07

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Table 5-32

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/1)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	2.07E-05	2.00E+00	1.03E-05	1.77E-06	NA	
Ethylbenzene	100-41-4	4.80E-04	3.20E-05	1.00E-01	3.20E-04	2.74E-06	NA	
MIBK	95-50-1	8.40E-07	5.60E-08	5.00E-02	1.12E-06	4.80E-09	NA	
Toluene	108-88-3	8.70E-03	5.80E-04	2.00E-01	2.90E-03	4.97E-05	NA	
Methylene Chloride	75-09-2	2.10E-04	1.40E-05	6.00E-02	2.33E-04	1.20E-06	7.50E-03	9.00E-09
Summed:					3.46E-03			9.00E-09

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Table 5-33

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	3.76E-10	2.00E+00	1.88E-10	3.22E-11	NA	
Ethylbenzene	100-41-4	4.80E-04	8.23E-07	1.00E-01	8.23E-06	7.06E-08	NA	
MIBK	95-50-1	8.40E-07	3.22E-10	5.00E-02	6.45E-09	2.76E-11	NA.	
Toluene	108-88-3	8.70E-03	5.68E-06	2.00E-01	2.84E-05	4.86E-07	NA	
Methylene Chloride	75-09-2	2.10E-04	4.53E-09	6.00E-02	7.55E-08	3.88E-10	7.50E-03	2.91E-12
Summed:					3.67E-05			2.91E-12

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Table 5-34

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.07E-04	2.00E+00	5.33E-05	9.14E-06	NA	
Ethylbenzene	100-41-4	2.00E+00	2.67E-05	1.00E-01	2.67E-04	2.29E-06	NA NA	
MIBK	95-50-1	6.00E-03	8.00E-08	5.00E-02	1.60E-06	6.86E-09	NA	
Toluene	108-88-3	2.10E+01	2.80E-04	2.00E-01	1.40E-03	2.40E-05	NA	
Methylene Chloride	75-09-2	3.00E+00	4.00E-05	6.00E-02	6.67E-04	3.43E-06	7.50E-03	2.57E-08
Summed:					2,39E-03			2.57E-08

Residential Child South Pad

Table 5-35

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00 ·	9.95E-04	2.00E+00	4.97E-04	8.52E-05	NA.	
Ethylbenzene	100-41-4	2.00E+00	2.49E~04	1.00E-01	2.49E-03	2.13E-05	NA	
MIBK	95-50-1	6.00E-03	7.46E-07	5.00E-02	1.49E-05	6.39E-08	NA	·
Toluene	108-88-3	2.10E+01	2.61E-03	2.00E-01	1.31E-02	2.24E-04	NA	
Methylene Chloride	75-09-2	3.00E+00	3.73E-04	6.00E-02	6.22E-03	3.20E-05	7.50E-03	2.40E-07
Summed:					2.23E-02			2.40E-07

Residential Child South Pad

Table 5-36

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.41E-05	1.88E-05	2.00E+00	9.39E-06	1.61E-06	NA.	
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	4.69E-06	2.90E-01	1.62E-05	4.02E-07	NA NA	
MIBK	95-50-1	6.00E-03	1.06E-08	1.41E-08	2.00E-02	7.04E-07	1.21E-09	NA.	
Toluene	108-88-3	2.10E+01	3.71E-05	4.93E-05	1.10E-01	4.48E-04	4.23E-06	NA	
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	7.04E-06	6.00E-02	1.17E-04	6.04E-07	1.60E-03	9.66E-10
Summed:						5.92E-04			9.66E-10

Residential Child South Pad

Table 5-37

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-03	1.28E-05	2 005+00	( LOF. D(	1.10E-06	NA.	
Ethylbenzene	100-41-4	2.40E-03	1.28E-05	2.00E+00 2.90E-01	6.40E-06 6.62E-05	1.10E-06 1.65E-06	NA NA	
MIBK	95-50-1	4.20E-06	3.36E-08	2.00E-02	1.68E-06	2.88E-09	NA NA	
Toluene	108-88-3	4.40E-02	3.52E-04	1.10E-01	3.20E-03	3.02E-05	NA.	
Methylene Chloride	75-09-2	1.10E-03	8.80E-06	6.00E-02	1.47E-04	7.54E-07	1.60E-03	1.21E-09
Summed:					3.42E-03			1.21E-09

Residential Child South Pad

Table 5-38

Inhalation of Chemicals From Vapors From Soil

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Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks	
Xylene	1330-20-7	7.14E-06	9.52E-06	2.00E+00	4.76E-06	8.16E-07	NA		
Ethylbenzene	100-41-4	8.48E-07	1.13E-06	2.90E-01	3.90E-06	9.69E-08	NA		
MIBK	95-50-1	1.83E-09	2.44E-09	2.00E-02	1.22E-07	2.09E-10	NA		
Toluene	108-88-3	6.36E-05	8.48E-05	1.10E-01	7.71E-04	7.27E-06	NA		
Methylene Chloride	75-09-2	3.33E-07	4.44E-07	6.00E-02	7.40E-06	3.80E-08	1.60E-03	6.09E-11	
Summed:					7.87E-04			6.09E-11	

Residential Child South Pad

Table 5-39

# Combined Hazard Index and Lifetime Cancer Risks

Compound	Combined Hazard CAS No. Index		Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	5.77E-04	0,00E+00
Ethylbenzene	100-41-4	3.16E-03	0.00E+00
MIBK	95-50-1	2.00E-05	0.00E+00
Toluene	108-88-3	2.10E-02	0.00E+00
Methylene Chloride	75-09-2	7.38E-03	2.77E-07
Summed:		3.22E-02	2.77E-07

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Residential Adult West Pad

Table 5-40

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	1.74E-06	2.00E+00	8.71E-07	7.47E-07	NA	
Ethylbenzene	100-41-4	3.90E-05	1.11E-06	1.00E-01	1.11E-05	4.78E-07	NA	
Methanol	67-56-1	3.40E-04	9.71E-06	5.00E-01	1.94E-05	4.16E-06	NA	
Toluene	108-88-3	3,90E-04	1.11E-05	2.00E-01	5.57E-05	4.78E-06	NA	
Summed:					8.72E-05			0.00E+00

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Residential Adult West Pad

Table 5-41

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	4.00E-11	2.00E+00	2.00E-11	1.71E-11	NA	
Ethylbenzene	100-41-4	3.90E-05	3.62E-08	1.00E-01	2.00E-11 3.62E-07	1.71E-11 1.55E-08	NA NA	
Methanol	67-56-1	3.40E-04	3.79E-11	5.00E-01	7.57E-11	1.62E-11	NA NA	
Toluene	108-88-3	3.90E-04	1,38E-07	2.00E-01	6.88E-07	5.89E-08	NA	
Summed:					1.05E-06			0.00E+00

Residential Adult West Pad

Table 5-42

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	3.14E-06	2.00E+00	1.57E-06	1.35E-06	NA	
Ethylbenzene	100-41-4	2.29E-01	3.27E-07	1.00E-01	3.27E-06	1.40E-07	NA	
Methanol	67-56-1	9.68E-01	1.38E-06	5.00E-01	2.77E-06	5.93E-07	NA	
Toluene	108-88-3	1.34E+00	1.91E-06	2.00E-01	9.57E-06	8.20E-07	NA	
Summed:					1.72E-05			0.00E+00

Residential Adult West Pad Table 5-43

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.43E-04	2.00E+00	7.15E-05	6.12E-05	NA	
Ethylbenzene	100-41-4	2.29E-01	1.49E-05	1.00E-01	1.49E-04	6.38E-06	NA	
Methanol	67-56-1	9.68E-01	2.52E-05	5.00E-01	5.03E-05	1.08E-05	NA	
Toluene	108-88-3	1.34E+00	8.70E-05	2.00E-01	4.35E-04	3.73E-05	NA	
Summed:					7.06E-04			0.00E+00

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Residential Adult West Pad

Table 5-44

# Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.39E-06	3.96E-07	2.00E+00	1.98E-07	1.70E-07	NA.	
Ethylbenzene	100-41-4	2,29E-01	1.45E-07	4.12E-08	2.90E-01	1.42E-07	1.77E-08	NA	
Methanol	67-56-1	9.68E-01	6.12E-07	1.74E-07	5.00E-01	3.48E-07	7.46E-08	NA	
Toluene	108-88-3	1.34E+00	8.47E-07	2.41E-07	1.10E-01	2.19E-06	1.03E-07	NA	
Summed:						2.88E-06			0.00E+00

Residential Adult West Pad

Table 5-45

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	5.31E-07	2.00E+00	2.66E-07	2.28E-07	NA	
Ethylbenzene	100-41-4	2.00E-04	3.43E-07	2.90E-01	1.18E-06	1.47E-07	NA	
Methanol	67-56-1	1.70E-03	2.91E-06	5.00E-01	5.83E-06	1.25E-06	NA	
Toluene	108-88-3	2.00E-03	3.43E-06	1.10E-01	3.12E-05	1.47E-06	NA	
Summed:					3.84E-05			0.00E+00

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Residential Adult West Pad

Table 5-46

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	1.40E-07	2.00E+00	7.00E-08	6.00E-08	NA	
Ethylbenzene	100-41-4	2.42E-08	6.91E-09	2.90E-01	2.38E-08	2.96E-09	NA	
Methanol	67-56-1	4.68E-07	1.34E-07	5.00E-01	2.67E-07	5.73E+08	NA	
Toluene	108-88-3	1.02E-06	2.91E-07	1.10E-01	2.65E-06	1.25E-07	NA	
Summed:					3.01E-06			0.00E+00

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Residential Adult West Pad

Table 5-47

#### Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.44E-05	0.00E+00
Ethylbenzene	100-41-4	1.65E-04	0.00E+00
Methanol	67-56-1	7.87E-05	0.00E+00
Toluene	108-88-3	5.35E~04	0.00E+00
Summed:		8.52E-04	0.00E+00

Table 5-48

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/1)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	4.07E-06	2.00E+00	2.03E-06	3.49E-07	NA	
Ethylbenzene	100-41-4	3.90E-05	2,60E-06	1.00E-01	2.60E-05	2,23E-07	NA	
Methanol	67-56-1	3.40E-04	2.27E-05	5.00E-01	4.53E-05	1.94E-06	NA	
Toluene	108-88-3	3.90E-04	2.60E-05	2.00E-01	1.30E-04	2.23E-06	NA	
Summed:					2.03E-04			0.00E+00

Table 5-49

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	7.40E-11	2.00E+00	3.70E-11	6.34E-12	NA	
Ethylbenzene	100-41-4	3,90E-05	6.69E-08	1.00E-01	6.69E-07	5.73E-09	NA	
Methanol	67-56-1	3,40E-04	7.01E-11	5.00E-01	1.40E-10	6.01E-12	NA	
Toluene	108-88-3	3,90E-04	2.54E-07	2.00E-01	1.27E-06	2.18E-08	NA	
Summed:					1.94E-06			0.00E+00

Table 5-50

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.93E-05	2.00E+00	1.47E-05	2.51E-06	AM	
Ethylbenzene	100-41-4	2.29E-01	3.05E-06	1.00E-01	3.05E-05	2.62E-07	NA	
Methanol	67-56-1	9.68E-01	1,29E-05	5.00E-01	2.58E-05	1.11E-06	NA	
Toluene	108-88-3	1.34E+00	1.79E-05	2.00E-01	8.93E-05	1.53E-06	NA	
Summed:					1.60E-04			0.00E+00

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Table 5-51

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
							1.	
Xylene	1330-20-7	2.20E+00	2.73E-04	2.00E+00	1.37E-04	2.34E-05	NA	<del></del>
Ethylbenzene	100-41-4	2,29E-01	2.85E-05	1.00E-01	2.85E-04	2.44E-06	NA	
Methanol	67-56-1	9.68E-01	4.81E-05	5.00E-01	9.63E-05	4,13E-06	NA	
Toluene	108-88-3	1.34E+00	1.67E-04	2.00E-01	8.33E-04	1.43E-05	NA	
Summed:					1.35E-03			0.00E+00

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Table 5-52

#### Inhalation of Chemicals from Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.39E-06	1.85E-06	2.00E+00	9.23E-07	1.58E-07	NA	
Ethylbenzene	100-41-4	2.29E-01	1.45E-07	1.92E-07	2.90E-01	6.63E-07	1.65E-08	NA	
Methanol	67-56-1	9,68E-01	6.12E-07	8.12E-07	5,00E-01	1.62E-06	6,96E-08	NA	
Toluene	108-88-3	1,34E+00	8.47E-07	1.12E-06	1.10E-01	1.02E-05	9.64E-08	NA	
Summed:						1.34E-05			0.00E+00

Table 5-53

## Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	2.48E-06	2.00E+00	1.24E-06	2.13E-07	NA.	
Ethylbenzene	100-41-4	2.00E-04	1.60E-06	2,90E-01	5.52E-06	1.37E-07	NA	
Methanol	67-56-1	1.70E-03	1.36E-05	5.00E-01	2.72E-05	1.17E-06	NA	
Toluene	108-88-3	2.00E-03	1.60E-05	1.10E-01	1.45E-04	1.37E-06	NA	
Summed:					1.79E-04			0,00E+00

Residential Child West Pad

Table 5-54

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	6.53E-07	2.00E+00	3.27E-07	5.60E-08	NA	
Ethylbenzene	100-41-4	2.42E-08	3,23E-08	2.90E-01	1,11E-07	2.76E-09	NA	
Methanol	67-56-1	4.68E-07	6.24E-07	5.00E-01	1.25E-06	5.35E-08	NA	
Toluene	108-88-3	1.02E-06	1.36E-06	1.10E-01	1.24E-05	1.17E-07	NA	
Summed:					1.40E-05			0.00E+00

Residential Child West Pad

Table 5-55

#### Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.56E-04	0.00E+00
Ethylbenzene	100-41-4	3.48E-04	0.00E+00
Methanol	67-56-1	1.96E-04	0.00E+00
Toluene	108-88-3	1.21E-03	0.00E+00
Summed:		1.91E-03	0.00E+00

#### 6.0 UNCERTAINTY ANALYSIS

This section qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the U.S. EPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in a real situation. Thus, the risks documented in this report are far in excess of those which would ever be anticipated to actually occur. The specific aspects of this assessment which produce those conclusions are noted below for each aspect of the risk assessment:

Representative Chemical Concentrations: OEPA (1991) requires the use of the highest detected chemical concentration as the representative concentration and the inclusion of any chemical detected above background levels in the risk assessment. This unrealistically conservative approach is in excess of that recommended by the U.S. EPA (1989b) and in excess of that required to meet the National Contingency Plan's stated goal of "protection of public health and the environment" (U.S. EPA, 1986a). The U.S. EPA typically requires the use of the 95% upper confidence limit on the arithmetic mean of a distribution of values, while the actual likelihood of exposure to chemicals is reflected in a geometric mean. The most appropriate description of exposure, and the most reflective of reality, is the use of stochastic methodologies, commonly referred to as "Monte Carlo" modeling.

Likelihood of Hypothetical Residential Land Use Actually Occurring: A critical conceptual aspect of the risk assessment is the assumed future land use. OEPA specifies that a residential setting must be addressed for risk assessment parameters for closure plans (1991). The probability that a residential development would be built on the site 10 or 50 years from now is extremely small, since the current owner has operated the facility for 30 years and intends to continue operations indefinitely.

Exposure Factors: OEPA has required that all chemicals detected in each area and their maximum concentrations be incorporated into the risk assessment. Considering a 30- year residential lifetime, it is difficult to conceive of a situation in which an individual would ingest soil, touch soil, ingest water, touch water, inhale volatiles, inhale particulates every day for that period. Each factor incorporated into the quantitative analysis of those exposures is at or above the 95% upper limit of the range of possible values for that factor. Thus, the hypothetical individual in question is at the 95% level for exposure in every conceivable manner. This exceeds the U.S. EPA's intent to achieve an analysis based on "reasonable maximum exposure" (1989b) and is not consistent with a real possibility for exposure. In addition, the summation of multiple factors at the 95% level leads to a summed conclusion value that is far in excess of 95%, and is likely to reach the 99.99% percentile.

Chemical Fate and Transport: A number of aspects of actual human exposure to chemicals in the environment are not accommodated in OEPA guidance. During a 30 year lifetime of exposure, assuming the chemical source is removed, chemical concentrations in any medium will decrease in a specific location. This may be due to biotic degradation, abiotic degradation, or attenuation (dispersion). The rate of decrease will be due to a multitude of environmental factors such as air, soil, or water conditions, chemical-specific factors such as volatility, solubility, or soil mobility, and physical conditions, such as sunlight. The resulting

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lower chemical concentrations will result in lower doses to exposed receptors. In many cases, modeling may incorporate factors to account for this loss, however, it was not incorporated into this assessment. For ground water, the example is most obvious. Under the conditions of the closure guidance, a receptor is assumed to drink 2 liters of water per day for 30 years containing chemicals consistent with the leaching of the highest detected concentration of each chemical in the area of concern. This overestimates the likely exposure to chemicals in groundwater.

Dose-Response: Regulatory approaches to risk assessment have required the identification of toxic potency factors for chemicals. For non-carcinogens, a hazard value has been identified on a chemical-specific basis. For putative carcinogens, the "cancer slope factor" has been used to derive an estimate of cancer potency. Because the slope factor is an upper 95th percentile confidence limit of the probability of a response based usually on experimental animal data, the resulting carcinogenic risk estimate will also be an upper-bound estimate. This means that the "true risk" will not exceed the risk estimate derived through the use of this model. This highly conservative approach will safely not produce an underestimate of the risk, however, even the Carcinogen Assessment Group of U.S. EPA (1986b) estimates that the lower limit of risk may be as low as zero. When biological factors are further considered, the best estimate of the risk at very low levels is often zero (Ames, 1987; Ames and Gold, 1991; USOMB, 1991).

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#### 7.0 CONCLUSION

The results for the three areas of concern, the Incinerator Area, the South Pad and the West Pad incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are below the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991), even with the incorporation of the unrealistically conservative approaches required by OEPA. No subsequent evaluation or post-closure monitoring is recommended.

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## APPENDIX A DATA SUMMARY

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### DATA SUMMARY PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO

## SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-330-I34	Incinerator Pad	34	9-24-92	6-12	8240	Non-Detect
CV-92-331-I34	Incinerator Pad	34	9-24-92	12-24	8240	Not Analyzed
CV-92-332-136	Incinerator Pad	36	9-24-92	6-12	8240	Non-Detect
CV-92-333-136	Incinerator Pad	36	9-24-92	12-24	8240	Not Analyzed
CV-92-334-I56	Incinerator Pad	56	9-24-92	6-12	8240	Non-Detect
CV-92-335-I56	Incinerator Pad	56	9-24-92	12-24	8240	Not Analyzed
CV-92-336-I113	Incinerator Pad	113	9-24-92	6-12	8240	Non-Detect
CV-92-337-I113	Incinerator Pad	113	9-24-92	12-24	8240	Not Analyzed
CV-92-338-I24	Incinerator Pad	24	9-24-92	12-24	8240	Not Analyzed
CV-92-339-I45	Incinerator Pad	45	9-24-92	12-24	8240	Not Analyzed
CV-92-524-52A	Incinerator Pad	24	10-31-92	12-24	8240	21 ppb Methylene Chloride
CV-92-525-145	Incinerator Pad	45	10-31-92	12-24	8240	13 ppb Methylene Chloride
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CV-92-340-W45	West Storage Pad	45	9-23-92	6-12	8240	Non-Detect
CV-92-341-W45	West Storage Pad	45	9-23-92	12-24	8240	Not Analyzed
CV-92-342-W51	West Storage Pad	51	9-23-92	6-12	8240	Non-Detect
CV-92-343-W51	West Storage Pad	51	9-23-92	12-24	8240	Not Analyzed
CV-92-344-W56	West Storage Pad	56	9-23-92	6-12	8240	Non-Detect
CV-92-345-W56	West Storage Pad	56	9-23-92	12-24	8240	Not Analyzed
CV-92-346-W60	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-347-W60A	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-359-W60A	West Storage Pad	60	9-23-92	12-24	8240	Not Analyzed

### SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-348-W6	West Storage Pad	6	9-23-92	12-24	8240	Not Analyzed
CV-92-349-W44	West Storage Pad	44	9-23-92	12-24	8240	Not Analyzed
CV-92-W6	West Storage Pad	6	10-31-92	12-24	8240	Non-Detect
CV-92W44	West Storage Pad	44	10-31-92	12-24	8240	Non-Detect
CV-92-350-S79	South Storage Pad	79	9-23-92	6-12	8240	6 ppb MIBK
CV-92-351-S79	South Storage Pad	79	9-23-92	12-24	8240	Non-Detect
CV-92-354-S152	South Storage Pad	152	9-23-92	6-12	8240	Non-Detect
CV-92-355-S152	South Storage Pad	152	9-23-92	12-24	8240	Not Analyzed
CV-92-360-S146	South Storage Pad	146	9-24-92	6-12	8240	Non-Detect
CV-92-353-S146	South Storage Pad	146	9-24-92	12-24	8240	Not Analyzed
CV-92-356-S100	South Storage Pad	100	9-23-92	12-24	8240	Not Analyzed
CV-92-526-S100	South Storage Pad	100	10-31-92	12-24	8240	31 ppb Methylene Chloride

PPB: Parts Per Billion

### SAMPLE SUMMARY PPG INDUSTRIES, INC. CIRCLEVILLE,OHIO

					<u> </u>	37114011	KY,1991				
SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	-	7137	CV-89-0221	Still Ped	M.H Sediment Sample	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	© Right © Right Ethylbenzene Meth. Chloride Xylenes © Right Aroclor 1248	BDL 2.48 0.228 0.335 BDL 6.700	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.0 Varios 0.167 0.167 0.167 1.0	Analysis for 9 PCBs all BDL except below
CV-89-0223	<b>.</b>	7137	CV-89-0222	Still Pad	Pipe Sediment Sample	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	© Right © Right MEK  Xylones © Right Aroclor 1248	BDL BDL 15.3 167.5 BDL 41,400	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.0 Varice 4.00 4.00 1.0 1.0	
CV-89-0223	-	7137	CV-89-0223	Still Pad	3rd Rinec	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	Right     Butyl Cellosolve     Right     Meth. Chloride     Right	BDL 85.4 BDL 169 BDL	mg/kg mg/L µg/L µg/L µg/L	1.0 Varies 100	
CV-89-07224	;	7137	CV-89-0224	Still Pad	Rimewater Source	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	Right Methanol Right Acetone Meth. Chloride Right	BDL 6.95 BDL 22.3 3.2 BDL	mg/L mg/L µg/L µg/L µg/L µg/L	1.0 Varios 10.0 2.00	· ·
B-131	S-131	7137	JC5491	South Pad	Soil Sample	7-Jul-89  7-Jul-89  17-Jul-89	© Right © Right Toluene	BDL BDL 2	mg/kg mg/kg mg/kg	0,965 Varie 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL except below
003	5-132	7137	JC5492	South Ped	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatice all BDL
904	S-135	7137	JC5493	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylones	BDL BDL 0.11	mg/kg mg/kg mg/kg	0.972 0.972 0.3	
005	5-136	7137	JC5494	South pad	Soil Sample	18-1ศ-89 18-1ศ-89 18-1ศ-89	Right Right Xylenes	BDL BDL 0,6	mg/kg mg/kg mg/kg	0.950 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL except below
006	S-137	7137	JC5495	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.971 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
007	S-140	7137	JC54%	South Pad	Soil Sample	18-Jนl-89 18-Jนl-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,960 Varies	
008	S-130	7137	JC5497	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

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SAMPLE #	Loc /	REPORT #	īLAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
009	S-129	7137	IC5498	South Pad	Soil Sample	18-1-1-89 18-1-1-89	⊕ Right ⊕ Right	BDL BDL	mg/kg mg/kg	0.967 Varice	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
010	S-126	7137	IC5499	South Pad	Soil Sample	18-1गा-86 18-1गा-86 18-1गा-86		BDL BDL 0.4	mg/kg mg/kg mg/kg	0.950 -Varies 0.3	Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL, except below
011	S-124	7137	JC5500	Scrath pad	Soit Sample	18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.952 Varice	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
012	S-121	7137	JC5501	South Pad	Soil Sample	18-1गा-83 18-1गा-83	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.952 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
013	S-107	7137	IC5502	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	20 Right 20 Right Meth. Chloride Toluene	BDL BDL 0.3 0,4	mg/kg mg/kg mg/kg mg/kg	0.971 Varica 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
014	S-109	7137	JC5503	South pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.992 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
015	S-109	7137	JC5530	Souh Ped	Soil Sample (Dupl. S-109)	18-Jul-89 18-Jul-89 18-Jul-89	Right     Right     Xylones	BDL BDL 0.6	mg/kg mg/kg mg/kg	0.969 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
016	S-113	7137	HC5504	South Pad	Soil Sample	8-Jul-89  8-Jul-89	② Right ④ Right	BDL BDL	mg/kg mg/kg	0.993 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
017	S-111	7137	JC5505	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.967 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
018	S-112	7137	JC5506	South Pad	Soil Sample	18-July-89 18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li><li>Toluene</li></ul>	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.977 Varies 0,3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
019	S-115	7137	JC5507	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.973 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
020	S-102	7137	JC5508	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
021	S-100	7137	JC5509	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Toluene Xylenes	BDL BDL 2 0.3 21 8	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.6 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
022	S-96	7137	JC5510	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

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SAMPLE #	LOC #	REPORT #	\LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
023	S-93	7137	JC5511	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right     Ø Right	BDL BDL	mg/kg mg/kg	0.988 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
024	S-80	7137	JC5512	South Pad	Soil Sample	8-Jul-89  8-Jul-89	② Right     ② Right     Toluene	BDL BDL 0.5	mg/kg mg/kg mg/kg	0.964 -Varios 0.3	Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL, except below
025	S-88	7137	IC5513	South Pad	Soil Sample	18-141-89 18-141-89 18-141-89	<ul><li>Right</li><li>Right</li><li>Meth. Chloride</li><li>Toluene</li></ul>	BDL BDL 0.5	mg/kg mg/kg mg/kg mg/kg	0.999 Varies 0,3 0.3	Analysis for n-Butanot, isobutanot, and Methanot Analysis for HSL Volatiles all BDL, except below
026	S-82	7137	JC5514	South Ped	Soil Sample	18-ไนโ-89 18-ไนโ-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.957 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C541	C541	7137	JC5541	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right Arclor 1254	BDL 0.334	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs all BDL, except below
027	S-77	7137	JC5515	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li><li>Meth. Chloride</li></ul>	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.966 Varice 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
028	S-71	7137	JC5516	South Pad	Soil Sample	18-14-89 18-14-89 18-14-89 18-14-89	@ Right @ Right Ethylbenzene Tohaene Xylenes	BDL BDL 0.3 17 0.16	mg/kg mg/kg mg/kg mg/kg mg/kg	0.993 Varios 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
029	S-72	7137	JC5517	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	© Right © Right Ethylbentzene Meth. Chloride Xylenes	BDL BDL 0.4 0.3 0.18	mg/kg mg/kg mg/kg mg/kg mg/kg	1.000 Varies 0.3 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
030	S-70	7137	JC5518	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.960 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
031	\$- <del>6</del> 9	7137	JC5519	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Meth. Chloride Toluene Xylenes	BDL BDL 0.3 3 1	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0,990 Varies 0,3 0,3 0,3 0,3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
032	S-65	7137	JC5520	South Ped	Soil Sample	18-ไป-89 18-ไป-89 18-ไป-89	Right Right Meth. Chlorde	BDL BDL 0.8	mg/kg mg/kg mg/kg	0.974 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volstiles all BDL, except below

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SAMPLE #	LOC #	REPORT #	₹.AB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
033	S-63	7137	JC5540	South Ped	Soil Sample (Dupl. S-55)	18-141-89 18-141-89 18-141-89	Right     Right     Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.977 Varics 0.3	1 * * * * * * * * * * * * * * * * * * *
034	S-58	7137	JC5521	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	Ø Right Ø Right Meth. Chloride Toluene	BDL BDL 0.3 0.3	mg/kg mg/kg mg/kg mg/kg	-0.962 Varies 0.3 0.3	Analysis for HSL Volatiles all BDL, except below
035	S-61	7137	JC5522	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	© Right © Right Toluene	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.976 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
036	S-49	7137	JC5523	South Pad	Soil Sample	18-Jul-89 18-Jul-89	ØRigha ØRigha	BDL BDL	mg/kg mg/kg	0.953 Varice	Analysis for n-Butanol, isobatanol, and Methanol Analysis for HSL Volatiles all BDL
037	5-44	7137	JC5524	South Pad	Soil Sample	18-1ग-89 18-1ग-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methenol Analysis for HSL Volatiles all BDL
038	S-40	7137	JC5525	South Pad	Soil Sample	8-Jul-89  8-Jul-89  8-Jul-89	@ Right @ Right Tolucne	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
039	S-26	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatilos all BDL
040	S-34	7137	JC5527	South Pad	Soil Sample	18-โน <del>โ-</del> 89	Ø Right Ø Right	BDL BDL	me/ke me/ke	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
041	S-31	7137	JC5526	South Pad	Soil Sample	18-1मा-83 18-1मा-83	Ø Right Ø Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
042	S-38	7137	JC5529	South Pad	Soit Sample	18-1गा-89 18-1गा-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.970 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
043	S-26	7137	JC5530	South Pad	Soil Sample	18-1गा-89 18-1गा-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,966 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
044	S-24	7137	IC5531	South Ped	Soil Sample	18-1m-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.953 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
045	5-21	7137	JC5532	South Pad	Soil Sample	18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li></ul>	BDL BDL	mg∕kg mg/kg	0.960 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
046	S-17	7137	JC5533	South Pad	Soil Sample	8-]ग्ग-89  8-]ग्ग-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
047	S-5	7137	JC5534	South Pad	Soil Sample	[8-]ग]-89 [8-]ग]-89	@ Right @ Right	BDL BDL	mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

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SAMPLE #	Loc #	REPORT #	³LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
048	S-14	7137	JC5535	South Pad	Soil Sample	18-Jग-89 18-Jग-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.999 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
049	S-9	7137	JC5536	South Pad	Soil Sample	18-Jนl-89 18-Jนl-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.996	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
050	<b>S-</b> 11	7137	JC5537	South Pad	Soil Sample	18-Jul-89 18-Jul-89	Right     Right	BDL BDL	mg/kg mg/kg	0.993 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
051	S-13	7137	JC5538	South Ped	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.983 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C544	C544	7137	JC5542	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right Aroclor 1254	BDL 3.56	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs and BDL, except below
052		7137	JC5552	General	Water Sample (Trip Blank)	18-Jul-89	@ Right @ Right	BDL BDL	mg/L mg/L	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
053	W-44	7137	JC5543	West Pad	Soil Sample	8-Jul-89  18-Jul-89  18-Jul-89  18-Jul-89	Right     Methanol     Right     Toluene	BDL 63988 BDL 1.34	mg/kg mg/kg mg/kg mg/kg	0.988 0.968 Varios 0.196	Analysis for n-Butanol and Isobutanol Only detected alcohol in West Pad soils Analysis for HSL Volatiles, all BDL except below
054	W-21	7137	JC5544	West pad	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, Isobutanol, and Methanol Analysis for HSL Volatiles all BDL
055	W-30	7137	JC5545	West Pad	Soil Sample	[8-Jul-89 [8-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	
056	W-40	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.988 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
057	W-6	7137	JC5547	West Ped	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.229 2.16	mg/kg mg/kg mg/kg mg/kg	0.964 Varice 0.186 0.186	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
058	W-38	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Tohuense	BDL BDL 0.621	mg/kg mg/kg mg/kg	0.973 Varies 0.190	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
059	W-15	7137	JC5549	West Pad	Soil Sample	[8-Jul-89	Ø Right     Ø Right	BDL BDL	mg/kg mg/kg	0.977 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
060	W-26	7137	JC5550	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.944 Varies	Analysis for n-Butanol, isobotanol, and Methanol Analysis for HSL Volatiles all BDL
061	W-12	7137	JC\$551	West Pad	Soil Sample	18-ไม่-89 18-ไม่-89	<ul><li>Right</li><li>Right</li><li>Xylenes</li></ul>	BDL BDL 0.454	mg/kg mg/kg mg/kg	0.979 Varice 0.199	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below

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SAMPLE #	Loc #	REPORT #	*LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
C542	C542	7137	JC5554	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs, all BDL
962	W-12	7137	JC5553	West Pad	Soil Sample (Dupt. W-12)	18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	1-9	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89	@ Right @ Rigut	BDL BDL	mg/kg mg/kg	0.975 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
064	I-44	7137	JC5556	Incinerator Area	Soil Sample	18-1गा-85 18-1गा-85	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.929 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volstiles all BDL
065	1-77	7137	JC5557	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	Ø Righa Ø Righa	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
066	1-64	7137	IC5558	Incinerator Area	Soil Sample	8-Jul-89   8-Jul-89   8-Jul-89   8-Jul-89	Right Right Right Ethylbenzene Xylenes	BDL BDL 0.3 0.9	mg/kg mg/kg mg/kg mg/kg	0.967 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except BDL
967	1-85	7137	JC5559	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	© Right © Right Ethylbenzene Xylenes	BDL BDL 0.6 0.7	mg/kg mg/kg mg/kg mg/kg	0.996 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
068	1-106	7137	JC5560	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	Ø Right Ø Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volstikes all BDL
069	I-72	7137	JC5561	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	Right     Right	BDL BDL	mg/kg mg/kg	0.962 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
070	1-72	7137	JC5573	Incinerator Area	Soil Sample (Dupl. 1-72)	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Xylenes	BDL BDL 0.4 1.7	mg/kg mg/kg mg/kg mg/kg	0.933 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
071	1-92	7137	IC5562	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1,000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
072	1-70	7137	IC5563	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li><li>Meth. Chloride</li></ul>	BDL BDL 0.3	mg/kg mg/kg mg/kg		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
073	1-76	7137	JC5564	Incinerator Area	Soil Sample	8-Jul-89  8-Jul-89	<ul><li>Right</li><li>Right</li></ul>	BDL BDL	mg/kg mg/kg	0.932 Varios	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
074	1-26	7137	JC5565	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.990 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
075	1-58	7137	JC5566	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0,955 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

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SAMPLE #	LOC #	REPORT #	"LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
076	1-6	7137	JC5567	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right     Ø Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanot, isobutanot, and Methanol Analysis for HSL Volatiles all BDL
077	1-24	7137	JC5568	Incincrator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	Right     Right     Ethylbenzene     Meth. Chloride     Xylenes	BDL BDL 2 4 4	mg/kg mg/kg mg/kg mg/kg mg/kg	0.969 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
078	1-26	7137	JC55 <del>69</del>	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li><li>Meth. Chloride</li></ul>	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.992 Varies 0,3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
079	1-48	7137	3C5670	Incinerator Area	Soit Sample	18-Jนl-89 18-Jนl-89 18-Jul-89	Ø Right Ø Right Xylenes	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.978 Varice 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
080	I-45	7137	JC5571	Incinerator Area	Soil Sample	18-141-89 18-141-89 18-141-89 18-141-89 18-141-89	© Right © Right Ethylbenzene 2-Hexanone Meth. Chloride Xylenes	BDL BDL 0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	0.945 Varies 0.3 0.6 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
081	1-60	7137	JC5572	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	<ul><li>Right</li><li>Right</li><li>Meth. Chloride</li></ul>	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.931 Varics 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C543	C543 .	7137	JC5574	Incincrator Area	Soil Sample	18-1 ul-89 18-1 ul-89 18-1 ul-89 18-1 ul-89 18-1 ul-89 18-1 ul-89	Ø Right Aroclor 1254 Ø Right HpCDD OCDD 2,37,8-TCDF TCDF	BDL 1.79 BDL 0.37 1.91 0.15 0.22	h8/k8 h8/k8 h8/k8 h8/k8 m8/k8	0.25 0.25 Varies  	Analysis for 7 PCBs all BDL except below  Analysis for 12 Cibenzo-P-Dioxins & Furence all BDL except below
085		7137	085	Incinerator	Final Phase Line 2	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	Methanol Iso-Butanol Butanol @ Right 2-Butanone Ethylbenzene 2-Hexanone Toluene Xylenes	93.1 10.1 86.3 BDL 39,000 36,000 720,000 75,000 240,000	mg/L mg/L mg/L µg/L µg/L µg/L µg/L µg/L µg/L	1.0 1.0 1.0 Varies 1,000 500 1,000 500	Analysis for HSL, Volatiles all BDL except below
086		7137	086	Incinerator	Distilled Rinse Water	24-Aug-89 24-Aug-89 24-Aug-89	@ Right @ Right Toluene	BDL BDL 170	mg/L μg/L μg/L	1.0 Varice 6	Analysis for n-Butanol, isobutanol, and Mothenol Analysis for HSL Volatiles all BDL, except below

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
087	-	7137	087	Incinerator	Service Water	24-Aug-89 24-Aug-89	Ø Right Ø Right	BDL BDL	mg/L µg/L		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
068		7137	068	Incinerator	Travol Blank	24-Aug-89	@ Right	BDL.	με/L	Varios	Analysis for HSL Volatiles all BDL
089	_	7137	089	Incinerator	Final Rinec Line I	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	Methanol Iso-butanol Butanol ② Right 2-Butanone Ethylbenzene 2-Hexanone Tohiene Xylenes	16,5 1.71 18.9 BDL 11,000 24,000 300,000 33,000 180,000	mg/L mg/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L u	1.0 1.0 1.0 Varies 1,000 1,000 600	Analysis for HSL Volatiles all BDL, except below
090	<del></del>	7137	090	Incinerator	Final Rinse Aqueous Weste	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	© Right © Right Ethylbenzene 2-Hexanone Toluene Xylenes	BDL BDL 9,900 1,900 15,000 31,000	mg/L µg/L µg/L µg/L µg/L µg/L		Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below

#### DETECTED COMPOUND SUMMARY

	<u> </u>		1			SAMPLE				DETECTION	
SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	DATE	ANALYSIS FOR	RESULTS	UNITS	LIMIT	COMMENTS
CV-89-0221	-	7137	CV-89-0221	STILL PAD	M.H. SEDIMENT SAMPLE	17-Apr-89 17-Apr-89 17-Apr-89 17-Apr-89	ETHYLBENZENE METH. CHLORIDE XYLENES ARCOCLOR 1248	2.48 0.228 0.335 6,700	mg/kg mg/kg mg/kg mg/kg	0.167 0.167 0.167 1.0	
CV-89-0222	•	7137	CV-89-0222	STILL PAD	PIPE SEDIMENT SAMPLE	17-Apr-89 17-Apr-89 17-Apr-89	MEK XYLENES AROCLOR 1248	15.3 167.5 41,400	mg/kg mg/kg mg/kg	4.00 4.00 ~- 1.0	
CV-89-0223		7137	CV-89-0223	STILL PAD	3rd RINSE	17-Apr-89 17-Apr-89	BUTYL CELLOSOLVE METH, CHLORIDE	85.4 169	mg/L ug/L	0,1 001	Initial run results shown, confirmed @ 84.1 mg/L
CV-89-0224		7137	CV-89-0224	STILL PAD	RINSEWATER SOURCE	17-Apr-89 17-Apr-89 17-Apr-89	METHANOL ACETONE METH. CHLORIDE	6.95 22.3 3.2	mg/L ug/L ug/L	1.0 10.0 2.0	
S-131	S-131	7137	S-131	SOUTH PAD	SOIL SAMPLE	17-Jul-89	TOLUENE	2	mg/kg	0.3	
004	S-135	7137	004	SOUTH PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.11	mg/kg	0.3	
905	S-136	7137	005	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.8	mg/kg	0.3	
010	S-126	7137	010	SOUTH PAD	SOIL SAMPLE	18-Jเป-89	TOLUENE	0.4	mg/kg	0.3	
013	\$-107	7137	013	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH, CHLORIDE TOLUENE	0.3 0.4	mg/kg mg/kg	0.3 0.3	
015	S-109	7137	015	SOUTH PAD	SOIL SAMPLE (DUPL, S-109)	18-Jul-89	XYLENES	0.6	mg/kg	0.3	
018	S-112	7137	018	SOUTH PAD	SOIL SAMPLE	18-141-89	TOLUENE	0.4	mg/kg	0.3	
021	S-t00	7137	021	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE TOLUENE XYLENES	2 0.3 21 8	mg/kg mg/kg mg/kg mg/kg	0.6 0.3 0.3 0.3	
024	S-80	7137	024	SOUTH PAD	SOIL SAMPLE	18-Մակ-89	TOLUENE	0.5	mg/kg	0.3	
025	S-88	7137	025	SOUTH PAD	SOIL SAMPLE	18-Jน -89 18-Jน -89	METH. CHLORIDE TOLUENE	0.5 2	mg/kg mg/kg	0.3 0.3	
C541	C541	7137	JC6641	SOUTH PAD	SOIL SAMPLE	[8-Jul-89	AROCLOR 1254	0.334	mg/kg	0.25	
027	S-77	7137	027	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH, CHLORIDE	0.3	mg/kg	0.3	
028	S-71	7137	028	SOUTH PAD	SOIL SAMPLE	[8-1ณ-89  8-1ณ-89	ETHYLBENZENE TOLUENE XYLENES	0.3 17 0.16	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
029	S-72	7137	029	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	0.4 0.3 0.18	mg/kg mg/kg mg/kg	0.3 0.3 0.3	

#### **DETECTED COMPOUND SUMMARY (Continued)**

F===		l i	<del>r —</del> —							11110	
SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
031	S-69	7137	031 3	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE TOLUENE XYLENES	0.3 3 i 1.8	mg/kg mg/kg mg/kg mg/kg	0.3 0.3 0.3 0.3	
032	S-55	7137	032	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.8	mg/kg	0,3	
033	S-55	7137	033	SOUTH PAD	SOIL SAMPLE (DUPL, S-55)	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
034	S-58	7137	034	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH, CHLORIDE TOLUENE	0.3 0.3	mg/kg mg/kg	0.3 0.3	
035	S-61	7137	035	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.3	mg/kg	0,3	
038	S-40	7137	038	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	,
C544	C544	7137	JC5542	SOUTH PAD	SOIL SAMPLE	18-141-89	AROCLOR 1254	3.56	mg/kg	0.25	
053	W-44	7137	JC5543	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METHANOL TOLUENE	0,968 1.34	mg/kg mg/kg	0,968 0.198	Only detected alcohol in West Pad soils
057	W-6	7137	JC5547	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0,229 2.16	mg/kg mg/kg	0.186 0.186	
058	W-38	7137	JC5548	WEST PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.621	mg/kg	0.190	
061	W-12	7137	JC5551	WEST PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0,454	mg/kg	0.199	
066	1-64	7137	066	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.3 0,9	mg/kg mg/kg	0.3 0.3	
067	1-85	7137	067	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.6 0.7	mg/kg mg/kg	0.3 0.3	
070	I-72	7137	070	INCINERATOR AREA	SOIL SAMPLE (DUPL. 1-72)	18-Jul-89 18-Jul-89	METH. CHLORIDE XYLENES	0.4 1.7	mg/kg mg/kg	0.3 0.3	
072	1-70	7137	072	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
077	I-24	7137	077	INCINERATOR AREA	SOIL SAMPLE	18-1ณ-89 18-1ณ-89	ETHYLBENZENE METH. CHLORIDE XYLENES	2 4 4	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
078	1-28	7137	078	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH, CHLORIDE	0.3	mg/kg	0.3	
079	[-48	7137	079	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	XYLENES	0.4	mg/kg	0.3	
080	[-45	7137	080	INCINERATOR AREA	SOIL SAMPLE	18-1/11-89 18-1/11-89 18-1/11-89	ETHYLBENZENE 2-HEXANONE METH. CHLORIDE XYLENES	0.6 3 - 0.4 2	mg/kg mg/kg mg/kg mg/kg	0.3 0.6 0.3 0.3	

#### DETECTED COMPOUND SUMMARY (Continued)

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
061	1-50	7137	08I <sup>1</sup>	INCINERATOR AREA	SOIL SAMPLE	18-1네-89	METH. CHLORIDE	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	AROCLOR 1254 HpCDD OCDD 2,3,7,8-TCDF TCDP	1.79 0.37 1.91 0.15 0.22	nt/gt nt/gt nt/gt nt/gt	0.25	·
085	-	7137	085	INCINERATOR	FINAL RINSE LINE 2	24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89 24-Aug-89	METHANOL ISO-BUTANOL BUTANOL 2-BUTANONE ETHYLBENZENE 7-HEXANONE TOLUENE XYLENES	93.1 10.1 85.3 39,000 36,000 720,000 75,000 240,000	mg/L mg/L Mg/L ug/L ug/L ug/L ug/L	1.0 1.0 1.00 1,000 500 1,000 500 500	
086	•	7137	086	INCINERATOR	DISTILLED RINSE WATER	24-Aug-89	TOLUENE	170	ug/L	5	
089	•	7137	089	INCINERATOR	FINAL RINSE LINE I		METHANOL ISO-BUTANOL BUTANOL 2-BUTANONE ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	16.5 1.71 18.9 11,000 24,000 300,000 33,000 180,000	mg/L mg/L mg/L ug/L ug/L ug/L ug/L ug/L	1.0 1.0 1.00 1,000 1,000 1,000 500 500	
090	•	7137	090	INCINERATOR	FINAL RINSE AQUEOUS WASTE	24-Aug-89	ETHYLBENZENE 2-HEXANONE TOLUENE XYLENES	9,900 1,900 15,000 31,000	սգ/L սգ/L սգ/L սգ/L	500 1,000 500 500	

### ATTACHMENT F

PCB Documentation/Certification

Regarding PPG Industries, Inc. (PPG) Partial Closure Plan for three drum storage areas and the liquid incinerator at the Circleville facility, Ohio EPA issued comments concerning the proposed revision to the Plan in letters dated November 20, 1991 (Comment 2) and dated June 28, 1991 (Comment 2). In order to obtain an approvable closure plan, PPG must demonstrate to Ohio EPA's satisfaction that polychlorinated biphenyl (PCB) levels recorded in these areas are unrelated to RCRA activities, and PPG must provide a statement certifying that none of the hazardous wastes handled at the units contained PCBs.

The results of the PPG's investigation into this matter are organized as follows:

- Since: waste characterization is often achieved by knowledge of the process generating the waste, a synopsis of the resin manufacturing process and associated wastes and the relationship of how PCBs were used in the facility is given first.
- The results of the investigation into historical waste analysis reports follows.
- Finally, a summary of analyses of current waste streams consistent with the wastes that were historically stored at the units to be closed is presented.

#### Resin Manufacturing Process

In the resin manufacturing process, monomers, organic acids, initiators, inhibitors, catalysts, glycols or solvents are combined in a reactor vessel to undergo reactions to form polymers. Some reactions require application of heat to the reactor to produce the desired reaction.

In cases where heat from steam jacketing of the reactor vessel is insufficient, oil is used as a heat transfer media to the reactor jacket because the oil can be heated to a higher temperature than steam. PCB oil (Aroclor 1248) was used for this heat transfer media because of its safety in terms of fire resistance. When the toxicity of PCBs became known, the PCB oil in this system was replaced with non-PCB oil. In early 1972, the hot oil systems at the PPG Circleville facility were drained into a tank truck and the fluid was transported offsite for processing. The systems were flushed with solvent and this material was transferred into a tank truck and transported off site for incineration. Non-PCB heat transfer oil (Therminol 66) was used to fill the systems.

The diagram in Attachment 1 shows an example of the application of the hot oil for heat transfer in the process. When calling for heat on the reactor, hot oil is pumped by the hot oil circulating pump from the furnace through the hot oil piping and through the reactor jacket which is mounted externally to the reactor vessel and then back to the furnace. When the reactor is calling for cooling, the oil flow is diverted by a valve through the cold oil loop. It is cooled in the cool oil fans (air cooled heat exchanger) and recirculated to the reactor jacket.

Another application of heat from the hot oil system is to the reboiler at the partial condenser unit. In this case, hot oil from the furnace is pumped through a tubed heat exchanger which is the reboiler. In both cases, hot oil does not make contact with the product. The heat from the hot oil system is released to the product through the wall of the vessel or through the tubing surface of the reboiler.

Wastes generated from the resin manufacturing process include samples taken during and after the reaction process, wastewater extracted from the process during reflux, solvents used for flushing process vessels between batches, waste resin generated during filtration and material transfer steps. These waste streams are all from the product in the reactor system vessel which has not been combined with, or made contact with, the heat transfer oil. In terms of the generator's knowledge of the process generating these wastes, PCB compounds are not part of the process generating these wastes since PCBs have never been ingredients used in the reactors to make resin polymers.

#### <u>Historical Waste Analysis</u>

Records pertinent to RCRA waste analysis were searched from 1980 to the present. In the years from 1980 to 1984, waste analysis information which was required for profile approval to dispose of wastes at commercial TSD facilities relied heavily on knowledge of the process generating the waste. Since PCBs were not used in the process materials, no analytical work was done pertaining to these compounds.

A revision to the facility Waste Analysis Plan in 1984 initiated more laboratory analysis, but PCBs were not specified in the Waste Analysis Plan and were not tested in the waste samples. The lab analysis report in Attachment 2 is typical of the lab analysis done at the time.

In 1986, a more comprehensive waste analysis program was started with analytical work performed by NUS Corporation. Lab results from this phase show that PCBs were not specifically analyzed, but a test for organic chlorine was performed on many of the waste samples. Inquiries made to the NUS laboratory indicate that the presence of a PCB compound in the sample should give a positive result on this test. In examination of these lab analysis reports, which are included as Attachment 3, the majority of reports show below the detection or quantification limit for organic chlorine. In the few reports which do show measurable organic chlorine, a correlation can be made to the presence of methylene chloride.

Analysis for PCB compounds was done in the waste analysis program by NUS in 1987. This data is included as Attachment 4. All of these reports show PCBs at less than detection except for one analytical report for a waste stream identified as Cationic Waste Resin which shows 39 mg/kg of PCB-1242. This isolated result is not in accord with the PCB compound Aroclor-1248 formerly used for heat transfer fluid at the facility. The result may be due to laboratory error, or due to the ubiquitous nature of PCBs in the environment.

#### Current Waste Analyses

Since 1987, waste analytical data from receipt samples at the Energy Recovery Unit has fulfilled most of the waste analysis requirements for the Circleville plant. Analysis for PCBs is a routine part of this testing. RCRA waste streams from the Circleville manufacturing plant have not shown presence of PCBs. Attachment 5 includes annual summaries from receipt samples of all current waste streams which are comparable to those that were previously stored in the units to be closed.

The RCRA wastes previously stored at the Waste Drum Storage Areas and the comparable currently generated waste streams can be summarized as follows:

- Waste Resin, D001, (alkyd, acrylic, polyester or epoxy polymers dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene, or methyl ethyl ketone). The following current waste streams documented in Attachment 5 are comparable: CRXADRC101, CRXADRC102, CRXADRC104, CRXDRSF111, CRXODRF101, CRXODRF102.
- Spent stripper containing methylene chloride (F002).

  This waste is comparable to current waste stream identified as CRXCCLF101 in Attachment 5.
  - Incinerator brick and residue generated by the incineration of F003 and F005 wastes. Analysis performed on samples of this material in 1988 for the purpose of evaluating this waste regarding Land Disposal Restrictions did not include analysis for PCBs. The analysis that was performed is included as Attachment 6. Waste streams that were input to this incinerator did not contain PCBs. Current wastes, documented in Attachment 5, that are the same as those that were incinerated in this unit are: CRXSSLF101, CRXOCWF101, CRXODRF101, CRXODRF102.
  - Waste acrylonitrile (U009). This waste stream is no longer generated in this form. Acrylonitrile is a raw material that has been used in a limited number of resin

formulas and is still used for one product manufactured at the PPG Circleville facility.

 Waste toluene diisocyanate (U223). This waste is the same as current waste stream identified as CRXRMSP107 in Attachment 5.

In summary, changes in resin formulation over the years have resulted in some variance in the amount of solvent constituents or the structure of resin polymers in the process wastes generated. However, these were not significant changes and the waste streams characterized in Attachment 5 are consistent with the wastes which were stored in the areas to be closed.

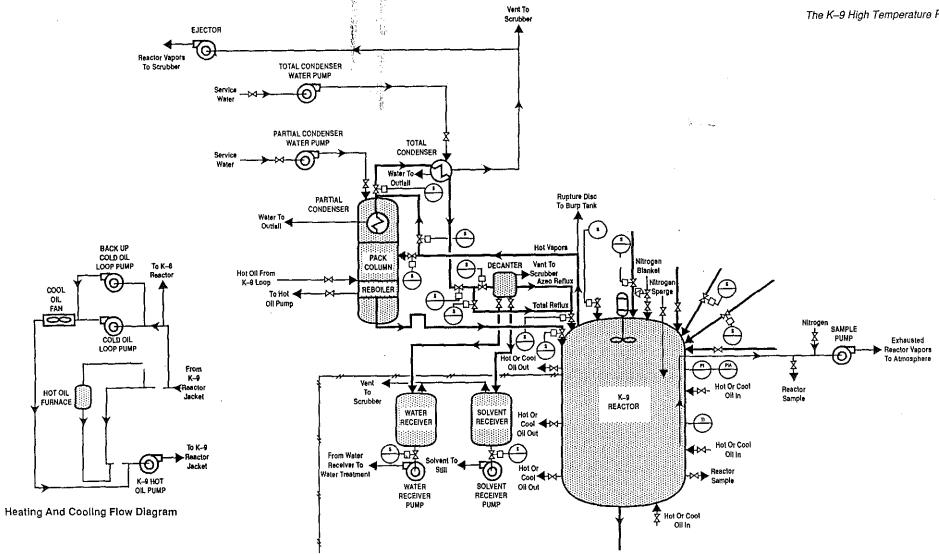
#### Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

\_Date

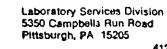
ATTACHMENT 1

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**Reacting Flows And Controls** 

ATTACHMENT 2



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

# LAB ANALYSIS REPORT

CLIENT NAME: ABORESS:	PPS INDUSTRIES, INC. P.O.BOX 457		NUS PROJECT NO: NUS CLIENT NO:	702820 320228
	CIRCLEVILLE, OH 43113		HUS SAMPLE NO.	140307
	REP	ORT BATE: 04/16/84		
ATTENTION:	DAVE WEIBEL		pate received.	03/19/
	SAMPLE IDENTIFICATION:	OFF-SPEE RESIN COMPOSITE	03/12	
		<b>*</b>		• .
TEST	DETERNINATION	RESULTS	UNITS	
			•	
\$915	% Ash @ 550 C	0.1	<b>x</b>	
\$040	British Thermal Units	15000	BTU/16	
\$490	Flash Paint (Pensky-Harten)	85	F	
\$165	2 Solids, total et 103 C	33.1	1	
\$168	Specific Weight	7.9	lb/gal	
\$210	Viscosity	53	CP T	
\$450	(and (Ph)	25	ad/1	

COM. .. S:

5950

Acid Digestion

# ATTACHMENT 3

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REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

STRE SLUDGE

### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

NUS SAMPLE NO: VENDOR NO:

16110424 01831710

321909

NORK ORDER NO: 55830

ATTENTION:

MR. DAVE MAZZOCCO

REPORT DATE: 01/11/87

DATE RECEIVED:

MUS CLIENT NO:

11/07/86

3 SAMPLE IDENTIFICATION: CV-86-0086-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Berallium (Be)	( 0.2	ES/
M140	Chronium (Cr)	< 1	<b>n</b> 4/1
<b>H200</b>	Lead (Pb)	8	ES/
M250	Mercury (Hs)	0.0090	mg/
8F01	Xulenes	240000	ms/
<b>0</b> F05	2-butanone	₹ 40000	mg/1_ \f
0F08	4-methy1-2-rentanone	43000	#5/1
0F99	Volatile Organic Scan		$N_{ij}$
8M20	Ethyl Acetate	( 0.1	* \
0M28	Methanol	⟨ 0.1	x /U/
0H48	Nateic Anhydride	( 1.0	2 \
0M57	n-Butanol	( 0.1	ž //
8M58	i-Butanol	( 0.1	4
DH64	Methal Amal Ketone	< 0.1	ž.
<b>IVO6</b> (4) 中央	Carbon Tetrachloride ***	9 (2000) 1 ( 2000) 1 1 4 P. P. P. P. P. P. P. P. P. P. P. P. P.	#S/1 :
BV19	Ethylbenzene	72000	89/]
8V22	Methylene Chloride	( 20000	rs/
0V25	Toluene	2₽000	mg/]
0.020 = 3-2-2-2010	Trichlorofluoromethane	<b>(</b> ≨20000	<b>25</b> /
5015	% Ash @ 550 C	` < 1	X
S040	British Thermal Units	17000	atu/15
\$064	Chlorine, Organic	< 0.1	ž.
S078	Fluorine, Orsanic	( 0.01	ž
\$195	X Water (Karl Fisher)	0.07	Z.
S950	Acid Bisestion		••
\$971	Ashins		
\$980	Oxusen Bomb Preparation		
H032	- Ammonia as N (distillation)	44	<b>m</b> 4/]
A435	'Kitro≤en, Kjeldahl (N)	180	45/
/SH440 A	Nitrosen, Orsanic (N)	140	B4/1
/- 4620 Form	Solids, total at 103 C	(138000) 13.8%	
W765 1861 HAL	Total Sulfur-Gravimetric(S)	33	<b>a</b> g/]
	tatively Identified Compound	Estimated Result	•
	Allenda Control Pages	25 000	

Acetic Acid, Butyl Ester

35,000

mg/1

Reviewed and Approved but JMC





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

MUS CLIENT NO:

321909

PITTSBURGH,

PA 15238

MUS SAMPLE NO: VENDOR NO:

16051372 01831710

REPORT DATE: 07/23/86

HORK ORDER NO:

55830

ATTENTION: MS. CHRIS BABKA

DATE RECEIVED:

05/28/86

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
H050	Beryllium (Be)	( 0.02	as/1
M200	Lead (Pb)	1.9	ng/]
H250	Mercury (Hs)	( 0.02	ms/1
0H03	Carbon Tetrachloride	⟨ 3.0	7.
8H04	Toluene	( 0.1	ž
0 <del>11</del> 05	Xylenes	( 0.1	ž
0006	Hertanes	2.5	ž
01110	Ethalbenzene	( 0.4	ž
0H23	Methal Ethal Ketone	( 0.5	ž
OH24	Methyl Isobutyl Ketone	11	ž
9H32	Butil Cellosolve	3.9	ž
0H44	Methylene Chloride	( 0.1	ž
9H48	Maleic Anhadride	( 0.1	"
0H57	n-Butanol	1.3	X
0H64	Methyl Amyl Ketone	( 0.1	ž
1. 1 2. <b>0165</b> (4) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Petroleum Ether	( 0.1	X
OH71	Trichlorofluoromethane	( 0.4	ž
5015	X Ash 2 550 C	⟨ 0.1	X.
S040	British Thermal Units	19000	BTU/1b
S064	Chlorine, Organic	( 0.1	ሂ
\$098	Fluorine, Organic	( 0.01	X.
S195	X Water (Karl Fisher)	2.4	Z
S950	Acid Disestion		
5971	Ashing		
S <b>98</b> 0	Oxygen Bomb Preparation		
₩032	Ammonia as N (distillation)	53	<b>≥</b> 9/1
H435	Nitrosen, Kjeldahl (N)	330	mg/1
H440	Nitrosen, Orsanic (N)	270	
H620	Solids, total at 103 C	168000	(6.8%) \$5/1

COMMENTS:

ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

Reviewed and Approved by: JMC





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

### LAB ANALYSIS REPORT

REPORT DATE: 01/11/87

CLIENT HAKE: PPS INDUSTRIES, INC.

> ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

PA

15238

**NUS CLIENT NO:** NUS SAMPLE NO: 321909

VENDOR NO:

16110421 01831710

HORK BRDER NO:

55830

ELI

ATTENTION: HR. DAVE MAZZOCCO

MR+RO WASTE S/7

DATE RECEIVED:

UNITS

as/1 **5**9/1 95/1 29/1

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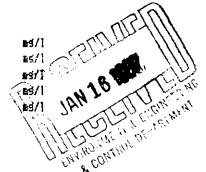
11/07/86

/ SAMPLE IDENTIFICATION: CV-86-0083-03

TEST	DETERMINATION	RESULTS
*		
MO50	Berullium (Be)	( 0.2
H140	Chronius (Cr)	<b>₹</b> 1
H200	Lead (Pb)	13
M250	Mercury (Hs)	0.005
8F01	Xulenes	8.5
0F05	2-butanone	3 >
8 <b>97</b> 8	4-methyl-2-pentanone	19
0F99	Volatile Ordanic Scan	
0H20	Ethyl Acetate	( 0.1
0M2E	Methanol	⟨ 0.1
<b>01148</b>	Maleic Anhydride	( 1.0
0H57	n-Butanol	₹ 0.1
0 <b>1158</b>	i-Butanol	0.4
0H64	Methyl Amyl Ketone	< 0.1
	ে <mark>Carbon Tetrachloride</mark> । ক প্ৰস্তু কলক <sub>ে ই</sub> জ ্বত	TU KHA, (4 🐃
DV19	Ethylbenzene	2.6
0V22	Methylene Chloride	( 4
0V25	Toluene	1.5
IMINATE OVSO	Trichlorofluoromethane	(4
S015	% Ash 8 550 C	<b>(1</b>
S040	British Thermal Units	- 16000
S064	Chlorine, Organic	< 0.1
8098	Fluorine, Orsanic	( 0.01
\$195	% Water (Karl Fisher)	2.1
S950	Acid Di≤estion	
S971	Ashing	
<b>\$980</b>	Oxagem Bomb Preparation	
H032	Ammonia as N (distillation)	44
· . (* <b>#435</b>	Mitrosen, Kieldahl (M)	190
<b>N440</b>	Nitrosen, Orsanic (N)	96
H620	Solids, total at 103 C	146000
H765	Total Sulfur-Gravimetric(S)	( 1

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

BTU



Reviewed and Approved by: JMC





## LAB ANALYSIS REPORT

CLIENT NAME:

PPS INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 01/11/87

NUS SAMPLE NO:

321909 16110423

VENDOR NO: NORK ORDER NO:

HUS CLIENT NO:

01831710 55830

ATTENTION:

MR. BAVE MAZZOCCO

SELECTRON

DATE RECEIVED: 11/07/86

> SAMPLE IDENTIFICATION: CV-86-0085-03

TE		DETERMINATION	RESULTS	UNITS					
no		Berullium (Be)	( 0.2	<u> </u>					
M1-	40	Chromium (Cr)	<b>{ 1</b>	mg/l					
<b>X2</b> (	00	Lead (Pb)	( 3	as/t					
H2	50	Mercurs (Hs)	< 0.004	ms/l					
OF	01	Xalenes	110	ms/1					
OF	05	2-butanone	1600	<b>⊪</b> ⊴/1					
<b>0</b> F	<b>)</b> 8	4-methy1-2-rentanone	1200	ns/l					
OF	99	Volatile Organic Scan							
OM	20	Ethyi Acetate	( 0.1	Z					
ort	28	Hethanol	0.1	ž					
-OM-	48	Maleic Anhydride	(1.0	ž					
ONI		n-Butanoj	( 0.1	Ž					
883		i-Butanol	0.34	* *					
014		Methyl Amyl Ketone	⟨ 0.1	, x					
-		Carbon Vetrachlorida espanoses in a	· ("40 ··*	ms/l					
OV		Ethylbenzene	₹ 40	ms/1					
87		Methylene Chloride	( 40	ms/ l					
	·	Toluene	64	ms/1					
		Trichlorofluoromethane;	(740 ₹	15/1					
S0	14-1 - 1 pc 7 4	X Ash 8 550 C	<b>\ 1</b>	x x					
SO-		British Thermal Units	MHC	*					
S0 <sub>6</sub>		Chlorine, Organic	⟨ 0.1	ž					
S0 <sup>-</sup>		Fluorine, Orsanic	(0.01	* *					
S1		2 Water (Karl Fisher)	72	Ŷ co					
S9:		Acid Disestion	12	الملائل المراجع					
S9:		Ashina		والمتعامل المتعارض والمتعارض	S99		Oxygen Bomb Preparation		الكلف مستشنق أبري
NO.		Ammonia as N (distillation)	1200	JAN 18					
84		Hitrosen, Kieldahl (N)	1200 1400	JAN ION E					
	e	Nitrosen, Orsanic (N)		190 J. Talbu					
્રાત્ર		Solids, total at 103 C	100	MS TALES					
X7	- C.		88300	#5/ UNROWNER DER					
•		Total Sulfur-Gravimetric(S)	(1	BAN FINANCHILATER DE					
18/ 18/	21 . Y. A.L.			6					

COMMENTS: NO VOLATILE ORGANICS ) 1% HERE DETECTED. NHC INDICATES THE SAMPLE WILL NOT COMBUST.

Reviewed and Approved by: JMC





LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238

NUS CLIENT NO: NUS SAMPLE NO:

321909 16051371

VENDOR NO:

01831710

HORK ORDER NO:

55830

ATTENTION:

MS. CHRIS BABKA

REPORT DATE: 07/23/86

DATE RECEIVED:

05/28/86

SAMPLE IDENTIFICATION: CV-86-0042-03 - Alkyd S/T Waste

TEST	DETERMINATION	RESULTS	UNITS
H050	Berallium (Be)	( 0.02	#5/l
M200	Lead (Pb)	3.5	29/3
H250	Hercury (Hg)	( 0.02	ns/1
BH03	Carbon Tetrachloride	( 0.3	7
0H04	Toluene	( 0.1	7
<b>0H0</b> 5	Xaleuez	1.4	7.
8M06	Kertanes	( 0.1	Ÿ.
OM10	Ethy Ibenzene	⟨ 0.4	γ,
6H23	Methyl Ethyl Ketone	( 0.1	ž
0H24	Methal Isobutal Ketone	21	γ,
0H32	Butal Cellosolve	15	ž
OM44	Methylene Chloride	⟨ 0.1	X
8M48	Maleic Anhydride	( 0.1	Ÿ.
OH57	n-Butano}	0.1	Y.
OH64	Methyl Amyl Ketone	( 0.1	ÿ
0M65	Petroleum Ether	( 0.1	ž
	Trichlorofluoromethane	( 0.4	"
5015	% Ash @ 550 C	⟨ 0.1	7.
\$040	British Thermal Units	9000	BTU/16
S064	Chlorine, Orsanic	( 0.1	χ
S0 <b>9</b> 8	Fluorine, Organic	( 0.01	X.
S1 <b>7</b> 5	% Water (Karl Fisher)	(10,157	χ,
S <b>9</b> 50	Acid Disestion	,	
5971	Ashins		
S980	Oxygen Bomb Preparation		
H032	Ammonia as N (distillation)	<b>2</b> 8	<b>m</b> ⊴/i
¥435 ,-	Nitrosen, Kieldahl (H)	740	ms/1
H440	Nitrosen, Orsanic (N)	720	ms/i
W620	Solids, total at 103 C	133000	nd/l

COMMENTS:

ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

Reviewed and Approved but UMS



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

#### LAR ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA

15238

REPORT DATE: 07/23/86

NUS CLIENT NO: NUS SAMPLE NO:

321909

VENDOR NO:

16051370 01831710

HORK ORDER NO: 55830 DATE RECEIVED: 05/28/86

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0041-03 - Selectron Waste S/T

TEST	DETERMINATION	RESULTS	UNITS
H050	Berullium (Be)	( 0.02	 m±/1
M200	Lead (Pb)	3.1	ms/1
M250	Mercury (Hs)	0.03	a9/1
DH03	Carbon Tetrachloride	₹ 3.0	X.
8M04	Toluene	(0.1	7
DM05	Xulenes	( 0.3	Z
0 <b>M</b> 06	Hertanes	2.3	7
OM10	Ethelbenzene	⟨ 0.7	ž
8H23	Methyl Ethyl Ketone	1.0	7.
DM24	Methyl Isobutyl Ketone	6.7	ž
0 <b>H3</b> 2	Butul Cellosolve	5.8	7
8M44	Methylene Chloride	0.10	ž
0M48	Maleic Anhudride	( 0.1	 %
OM57	n-Butanoi	1.6	" %
CM64	Methal Amal Ketone	( 0.1	$\hat{\chi}$
0M65	Petroleum Ether	⟨ 0.1	<b>X</b>
	····Trichlorofluoromethane	( 0.4	ž
S015	X Ash @ 550 C	{ 0.1	χ
5040	British Thermal Units	15000	ETU/1b
S064	Chlorine, Organic	0.16	Z.
5098	Fluorine, Organic	( 0.01	7
S195	% Water (Karl Fisher)	1.8	X
S950	Acid Digestion		
S971	Ashins		
5980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	56	<b>m</b> s/1
N435	Nitrosen, Kjeldahl (H)	360	rs/ì
H440	Nitrosen, Orsanic (N)	300	ms/1
W620	Solids, total at 103 C	277000	ms/1

COMMENTS:

Reviewed and Approved by: UMC

A Halliburton Company

ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT



412-788-1080

# LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

B4 4F6

PA 15238

REPORT DATE: 07/23/86

NUS CLIENT NO: NUS SAMPLE NO: 321909 16051369

VENDOR NO:

01831710

NORK ORDER NO: DATE RECEIVED:

55830 05/28/86

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0040-03 - MR & RD Waste Storage Samples

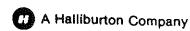
TEST	DETERMINATION	RESULTS	ETINU
H050	Bersilium (Be)	( 0.02	as/1
H200	Lead (Pb)	2.2	ms/)
H250	Mercury (Hs)	0.05	ms/1
0M03	Carbon Tetrachloride	⟨ 3.0	% %
0M04	Toluene	( 0.1	Ž.
0H05	Xulenes	( 0.1	Ž.
<b>8H0</b> 6	Hertanes	2.8	ž
OM10	Ethylbenzene	⟨ 0.1	7,
9M23	Methyl Ethyl Ketone	1.3	Ž
0M24	Methyl Isobutyl Ketone	3.4	Ž.
0H32	Butal Cellosolve	1.8	
0 <del>1144</del>	Methylene Chloride	0.19	% %
9M48	Maleic Anhadride	( 0,1	" "
<b>0</b> H57	n-Butanol	1.0	7.
0M64	Methal Amal Ketone	( 0.1	Ä
0H65	Petroleum Ether	( 0.1	ž
<u> 1 151 254<b>6N71</b> 13</u> 155 4	<u>Irichlorofluoromethane</u>	( 0.4	y X
S015	% Ash @ 550 C	⟨ 0.1	ž
· • • • • • • • • • • • • • • • • • • •	British Thermal Units	15000	BTU/1b
S064	Chlorine, Orsanic	0.46	7.
S195	% Water (Karl Fisher)	3,61	Ä
<b>S</b> 950	Acid Disestion		
S971	Ashins		
S980	Oxygen Bomb Preparation		
но32	Ammonia as H (distillation)	45	ms/l
N435	Nitrosen, Kjeldahl (N)	360	#9/ì
W440	Mitrosen, Orsanic (M)	320	#S/}
N620	Solids, total at 103 C	393000	£4/]

COMMENTS:

JUL 2 5 1986

ENVIRONMENTAL ENGINEERING

& CONTROL DEPARTMENT





#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238

REPORT DATE: 07/23/86

VENDOR NO:

NUS CLIENT NO:

NUS SAMPLE NO:

16051374 01831710

321909

HORK ORDER NO: 55830 DATE RECEIVED: 05/28/86

ATTENTION:

MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0048-03 - WPS-18384 (ACEYLIC RESID, HEPTANE SOLVENT)

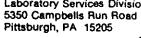
TEST	DETERMINATION	RESULTS	UNITS
S015	% Ash 8 550 C	( 0.1	Z
S064	Chlorine, Organic	< 0.1	X
S980	Oxygen Bomb Preparation		

**ENVIRONMENTAL ENGINEERING** & CONTROL DEPARTMENT

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COMMENTS:





#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 07/23/86

NUS CLIENT NO: NUS SAMPLE NO:

321909 16051372

VENDOR NO:

01831710

WORK ORDER NO:

55830 05/28/86

ATTENTION:

MS. CHRIS BABKA

DATE RECEIVED:

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Berullium (Be)	( 0.02	<u></u> m≤/1
H200	Lead (Pb)	1.9	₽9/1
M250	Mercury (H≤)	( 0.02	ag/1
<b>0M03</b>	Carbon Tetrachloride	₹ 3.0	Z.
0H04	Toluene	( 0.1	%
0H05	Xylenes	( 0.1	Z
0H06	Hertanes	2,5	7.
OH10	Ethylbenzene	⟨ 0.4	%
0H23	Methal Ethal Ketone	( 0.5	l
0H24	Methyl Isobutyl Ketone	11	%
9M32	Butal Cellosolve	3.9	X.
9M44	Methalene Chloride	< 0.1	χ
0 <b>H4</b> 8	Maleic Anhadride	( 0.1	<b>y</b>
OM57	n-Butanol	1.3	X
QH64	Methal Amal Ketone	( 0.1	7
OH65	Petroleum Ether	< 0.1	%
2007 2	Tricklorofluoromethane	( 0.4	Z.
S015	X Ash @ 550 C	( 0.1	7.
5040	British Thermal Units	19000	ETU/1b
S064	Chlorine, Ordanic	⟨ 0.1	X.
S098	Fluorine, Ordanic	( 0.01	74
S195	% Hater (Karl Fisher)	2.4	%
S950	Acid Disestion		
5971	Ashing		
S780	Oxygen Bomb Preparation		
H032	Ammonia as N (distillation)	53	<b>≘</b> ⊴/}
H435	Nitrosen, Kieldahl (N)	330	ms/1
H440	Mitrosen, Orsanic (M)	270	<b>a</b> g/]
H620	Solids, total at 103 C	168000	as/1

COMMENTS:

ENVIRONMENTAL ENGINEERING

& CONTROL DEPARTMENT

Reviewed and Approved but UMS



LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PΑ

15238

REPORT DATE: 07/23/86

HORK ORDER NO: DATE RECEIVED:

HUS CLIENT HO:

NUS SAMPLE NO:

VENDOR NO:

16051375 01831710 55830

321909

05/28/86

ATTENTION: MS. CHRIS BABKA

SAMPLE IDENTIFICATION: CV-86-0049-03 - 75-10 Floor Stripper - Used

TEST	DETERMINATION	RESULTS	ENITS
M050	Beryllium (De)	( 0.02	r:5/1
M200	Lead (Pb)	3.3	m≤/1
H250	Mercury (Hs)	0.11	ms/1
DF01	Xylenes	2.7	ž.
0F05	2-butanone	( 0.8	ĭ
0F08	4-methyl-2-pentanone	3.3	ž
8M29	Ethanol	3.5	ž
0M32	Butsl Cellosolve	0.86	%
0V19	Ethylbenzene	0.7	7
0V22	Methalene Chloride	15	X
0V25	Toluene	0.7	Y /#
DV91	Volatile Orsanic Scan		
9015	% Ash 8 550 C	1.0	X
S040	British Thermal Units	8200	BTU/16
S044	Chlorine, Orsanic	10	Z.
S195	% Water (Karl Fisher)	23.2	%
<b>€950</b> =	Aeid Disestion		
5971	Ashins		
5980	Oxygen Bomb Preparation		
H620	Solids, total at 103 C	205000	m9/]

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS ) 1% WERE DETECTED.

**ENVIRONMENTAL ENGINEERING** & CONTROL DEPARTMENT

Reviewed and Approved by: UMC





### LAB ANALYSIS REPORT

CLIENT NAME: ADDRESS:

PPG INDUSTRIES, INC.

260 KAPPA DRIVE

15238 PΑ

MUS CLIENT NO: NUS SAMPLE NO:

321909 16110422

PITTSBURGH,

REPORT DATE: 01/11/87

VENDOR NO: HORK ORDER NO: 01831710

ATTENTION:

HR. BAVE HAZZOCCO

ALKYD WASTE S/T

DATE RECEIVED:

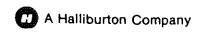
55830 11/07/86

SAMPLE IDENTIFICATION: CV-86-0084-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Berullium (Be)	( 0.2	mg/i
H140	Chromium (Cr)	(1	ms/1
<b>#200</b>	Lead (Pb)	(3	#4/ T
M250	Mercury (Hg)	0.032	ms/1
0F01	Xylenes	94000	mes/!
0F05	2-butanone	( 40000	ms/1
0F <b>0</b> 8	4-methy1-2-rentamone	170000	<b>E</b> 4/
0F99	Volatile Organic Scan		<b>37</b> 1
8M20	Ethyl Acetate	( 0.1	ž
0M28	Methanol	0.1	ż
3N48	Maleic Anhudride	(1.0	7
OM57	n-Butanol	₹ 0.1	ž
8 <b>3158</b>	i-Butanol	( 0.1	ž
OK64	Methyl Amyl Ketone	₹ 0.1	ź
<b>6006</b>	Halls Carbon Tetrachlor (de f	€ 20000 7	as/1**
0V19	Ethylbenzene	30000	ms/I
8V22	Methylane Chloride	( 20000	ms/!
0V25	Toluene	23000	mg/1
PV30	Tricklorofluoroaetham	( 20000	113/1 <sup>2</sup>
S015	X Ash & 550 C	(1	. ■3/ t
S040	British Thermal Units	16000	BTU/15
S064	Chlorine, Organic	0.3	7
S <b>99</b> 8	Fluorine, Orsanic	0.03	ž
\$195	% Water (Karl Fisher)	1.9	î
S <b>95</b> 0	Acid Disestion	•••	^
\$971	Ashing		
5980	Oxysen Bomb Preparation		
H032	Ammonia as N (distillation)	93	#4/)
¥435	Hitrosen, Kjeldahl (N)	310	E9/1
N440	Nitrosen, Organic (N)	220	#5/1 #5/1
, <b>¥620</b>	Solids, total at 103 C	112000	_ms/  #⊴/[
N765	Total Sulfer-Gravimetric(S)	2.7	ms/ (
	BAS .	217	
55005074. 44 45557			\

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 12 HERE DETECTED.

Reviewed and Arrroved by: JMC



REMIT TO:

Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. LOWER PHASE

#### LAE ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

NUS CLIENT NO: 321909

NUS SAMPLE NO:

17051366

VENDOR NO:

01831710 55830

WORK ORDER NO: DATE RECEIVED:

05/27/87

ATTENTION:

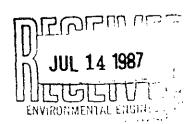
MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0189-03 LOWER PHASE

REPORT DATE: 07/13/87

05/11

TEST	DETERMINATION	RESULTS	UNITS
H050	Berullium (Be)	( 0.05	mg/l
M200	Lead (Pb)	1.6	mg/l
M250	Mercura (Ha)	0.050	as/l
0F01	X91enes	( 20000	ms/l
0F05	2-Butanone (MEK)	67000	<b>a</b> s/1
0F08	4-Methy1-2-Pentanone (MIBK)	{ 40000	±5/1
DF <b>0</b> 9	Styrene	< 20000	#4/1
0F99	Volatile Orsanic Scan		
0H07	2-Butoxy ethanol	1.3	χ
OH12	Kerosene	⟨ 0.1	X.
OH29	Ethanol	1.6	Z
CH32	Butyl Cellosolve	1.1	<b>X</b>
DN36	Mineral spirits	( 0.1	7.
0M51	Ethylene Glycol	( 0.1	7.
0H61	Butyl Acetate	0.35	7.
01/64	Methyl Amyl Ketone	( 0.1	7
0022	Naptha	⟨ 0.2	ኧ
	Hertane	⟨ 0.1	ĭ
0V22	Methylene Chloride	450000	#4/l
0V25	Toluene	( 20000	ms/1
0V27	1,1,1-Trichloroethane	( 20000	ms/l
0V28	1,1,2-Trichloroethane	₹ 20000	md/]
<b>S015</b>	% Ash at 550 C	0.1	ζ.
S040	British Thermal Units	9610	BTU/16
S06 <del>4</del>	Chlorine, Organic	30	7.
S090	Flash Point (Pensky-Marten)	80	F
<b>S098</b> **	Fluorine, Orsanic	( 0.01	L
\$168	Specific Weisht	9.2	1b/9a1
\$195	% Water (Karl Fisher)	2.2	X
S210	Viscosity	20	CP
<b>5780</b>	Oxygen Bomb Preparation		کا لکہ سامری
H315	Halosens, Total Orsanic (TOX)	INT	· · · · · · · · · · · · · · · · · · ·
		7	-+41





IÉNT ORIGINAL



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. LOWER PHASE

#### ANALYSIS REPORT LAB

CLIENT NAME: ADDRESS:

PPG INDUSTRIES, INC.

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

NUS CLIENT NO: NUS SAMPLE NO: 321909 17051366

VENDOR NO:

01831710

ATTENTION:

MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

HORK ORDER NO: DATE RECEIVED: 55830

05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 LOWER PHASE

05/11

TEST

عويدين والرواق أبات بالمهاهية الإلى ينات المات

and the second second second second

DETERMINATION

RESULTS

UNITS

**H620** 

Solids, Total at 103 C

210000

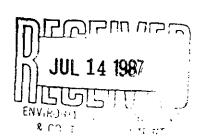
RS/l

Toluene

**Ethylbenzene** 

9800 < 20000 mg/1mg/1





COMMENTS: Sample contained dasoline at concentration of 8.9%. INT for TOX; Sample is not soluble in water.



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

NUS CLIENT NO:

NUS SAMPLE NO:

**VENDOR NO:** 

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. UPPER PHASE

#### LAE ANALYSIS REFORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

REPORT DATE: 07/13/87

HORK ORDER NO: DATE RECEIVED: 17051365 01831710

321909

55830 05/27/87

ATTENTION: MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE

05/11

TEST	DETERMINATION	RESULTS	UNITS
<del>105</del> 0	Berallium (Be)	( 0,05	mg/]
H200	Lead (Pb)	1.3	ms/)
M250	Mercury (Hg)	( 0.004	as/l
OFO1	Xylenes	{ 400	as/1
8F05	2-Butanone (MEK)	8200	<b>6</b> 4/1
0F08	4-Methy1-2-Pentanone (MIBK)	( 800	ms/1
0F09	Styrene	( 400	as/1
0F99	Volatile Organic Scan		
DM07	2-Butoxy ethanol	0.21	%
0M12	Kerosene	( 0.1	%
DH29	Ethanol	3,6	ž
0M32	Butyl Cellosolve	0.13	7.
0H36	Mineral spirits	( 0.1	Ž.
0 <del>8</del> 51	Ethylene Glycol	₹ 0.1	X
OM61	Butyl Acetate	( 0.1	ž.
0864	Methyl Amyl Ketone	( 0.1	ž
0022	Naetha	( 0.2	ž
0023	Hertane	⟨ 0.1	7.
- OV22	- Methylene Chloride	9000	m≤/l
0V25	Toluene	₹ 400	ms/1
<b>0</b> V27	1.1.1-Trichloroethane	( 400	mg/l
0V28	1/1/2-Trichloroethane	( 400	RS/]
<b>S015</b>	X Ash at 550 C	1.4	7,
S040	British Thermal Units	1800	BTU/1b
S064	Chlorine, Orsanic	0.10	%
S090	Flash Point (Pensky-Marten)	( /= 70	F
<b>50</b> 98	Fluorine, Orsanic	( 0.01	ž
S168 ~	Specific Weight	8.4	lb/gal
\$1 <b>9</b> 5	% Water (Karl Fisher)	62	X X
S210	Viscosita	12	CP
S980	Oxygen Bomb Preparation	_	-
H315	Halosens, Total Orsanic (TOX)	17000	แร/ไ







REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. UPPER PHASE

## LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

PA 15238

NUS CLIENT NO: NUS SAMPLE NO:

321909 17051365

VENDOR NO:

01831710

WORK ORDER NO: DATE RECEIVED: 55830

ATTENTION:

MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE

05/11

TEST -----N620

Solids, Total at 103 C

DETERMINATION

28100

UNITS

00

M3/1

Acetone

Ethylbenzene Toluene

mg/l mg/l mg/l

CAK 7/13/87

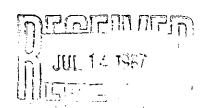
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COMMENTS:



Reviewed and Approved by: JMC



PAGE NO: 2

CLIENT ORIGINAL

# ATTACHMENT 4



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

CATIONIC WASTE RESIN

### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

15238 PA

**REPORT DATE: 08/20/87** 

NUS CLIENT NO: NUS SAMPLE NO: **VENDOR NO:** 

321909 17072328

WORK DRIDER NO:

01831710

DATE RECEIVED:

55830 07/30/87

ATTENTION:

MR. DAVE MAZZOCCO

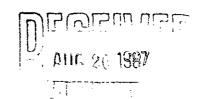
SAMPLE IDENTIFICATION: CV-87-0207-03

07/21

TEST	DETERMINATION	RESULTS	UNITS
H050	Beryllium (Be)	( 0.05	<b>=</b> 9/1
H140	Chromium (Cr)	⟨ 0.1	<b>≥</b> 4/1
M200	Lead (Pb)	( 0.3	ms/l
M250	Hercury (Hg)	( 0.004	<b>a</b> ≰/]
M270	Nickel (Ni)	( 0.3	<b>⊪</b> ⊴/]
H330	Thallium (T1)	⟨1	<b>m</b> ≤/]
OF01	Xylenes	1100	ms/1
OF05	2-Butanone (MEK)	6300	ms/1
0F08	4-Methyl-2-Pentanone (MIBK)	3900	<b>1</b> 9/
OF99	Volatile Orsanic Scan	••••	(
OH20	Ethyl Acetate	( 1.0	us/l
ON28	Methanol	0.16	χ.
DN48	Maleic Anhydride	( 0.5	ž
OM57	n-Butanol	1.2	 %
ON58	i-Butanol	⟨ 0.2	ű
0864	Methyl Amyl Ketone	₹ 0.1	, X
OP80	Total PCBs	39	#5/kg 1242 ←
OV19	Ethylbenzene	220	m4/1
OV22	Methylene Chloride	6400	m4/1
<b>0V25</b>	Toluene	₹ 200	<b>a</b> ⊴/1
S015	% Ash at 550 C	0.1	7
S040	British Thermal Units	HNC	
S064	Chlorine, Organic	0.08	7
5098	Fluorine, Organic	⟨ 0.01	" %
S195	% Water (Karl Fisher)	60	ÿ
5980	Oxygen Bomb Preparation		
H032	Ammonia - Distillation (as N)	6.5	mg/1
H435	Nitrosen, Kjeldahl (N)	240	ms/ 1
W440	Nitrosen, Orsanic (N)	230	<b>2</b> 5/1
N765	Total Sulfur (S)-gravimetric	INT	

COMMENTS: NO ADDITIONAL VOLATILE COMPOUNDS WERE IDENTIFIED.

Reviewed and Approved by: JCS





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

## SPEC-CATIONIC CLEANUP

### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PΛ 15238

REPORT DATE: 08/20/87

NUS CLIENT NO: NUS SAMPLE NO: VENDOR NO:

321909 17072327

01831710 **HORK ORDER NO:** 55830

DATE RECEIVED: 07/30/87

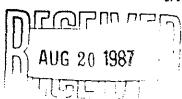
ATTENTION:

HR. DAVE: MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0206-03

07/21

TEST	DETERMINATION	RESULTS	UNITS
H270	RCRA METALS	<del></del>	
M030	Arsenic (As)	{ 0.01	<b>⊪</b> ⊴/1
M040	Barium (Ba)	(1	ms/1
<b>H09</b> 0	Cadmium (Cd)	₹ 0.05	ms/1
H140	Chromium (Cr)	( 0.1	∎ <b>s/</b> }
M200	Lead (Pb)	⟨ 0.3	æ⊴/1
M250	Mercury (Hs)	0.01	<b>m</b> 3/1
M290	Selenium (Se)	⟨ 0.04	ms/1
H300	Silver (Ag)	( 0.1	<b>m</b> ⊴/1
H270	Nickel (Ni)	₹ 0,3	<b>≥</b> 4/]
H330	Thallium (T1)	(1	#4/1
0F01	Xy1 enes	180000	<b>n</b> 4/1
0F05	2-Bu tanone (MEK)	( 4000	ms/l
0F08	4-Methy1-2-Pentanone (MIBK)	130000	∎⊴/1
0H32	Butal Cellosolve	50	X X
0164	Methal Amal Ketone	( 2.0	ž
OP80	Total PCBs	( 10	ng/kg
0006	Carbon Tetrachloride	₹ 2000	#4/1
QV19	Ethylbenzene	35000	<b>a</b> 4/1
0V22	Methylene Chloride	₹ 2000	<b>e</b> 4/1
0V25	Toluene	( 2000	<b>a</b> s/1
0V30	Trichlorofluoromethane	( 2000	<b>a</b> ⊴/1
0 <b>V</b> 91	Volatile Organic Analysis		
<b>S015</b>	% Ash at 550 C	{ 0.1	X
S040	British Thermal Units	12200	BTU/1b
\$064 <i></i>	Chlorine, Orsanic	( 0.01	X
S098	Fluorine, Organic	( 0.01	X
\$195	% Water (Karl Fisher)	0.4	<b>χ</b>
S98 <b>0</b>	Oxygen Bomb Preparation		<del></del>
H032	Ammonia - Distillation (as N)	1,4	<b>±</b> 9/]
H435	Nitrosen, Kieldahl (M)	370	<b>±</b> 9/1
<b>H44</b> 0	Nitrosen, Orsanic (N)	370	<b>±</b> 5/1



PAGE NO: 1



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

## CATIONIC FLUSHWATER

#### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA BRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 06/04/87

**VENDOR NO:** HORK ORDER NO:

NUS CLIENT NO:

NUS SAMPLE NO:

17041489 01831710

321909

DATE RECEIVED:

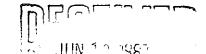
55830 04/24/87

ATTENTION:

MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0172-03

TEST	DETERMINATION	RESULTS	UNITS
N050	Berallium (Be)	( 0.05	ES/1
H140	Chromium (Cr)	⟨ 0.1	ms/1
M200	Lead (Pb)	2.6	<b>m</b> 5/1
M250	Mercury (Hs)	( 0.004	<b>⊪</b> ⊴/}
QF01	Xylenes	(66)	<b>a</b> 4/1
0F08	4-Methy1-2-Pentanone (MIBK)	1200	<b>a</b> 4/1
0F99	Volatile Orsanic Scan	•	
0H32	Butyl Cellosolve	( 0.1	X
QH57	n-Butanol	( 0.1	ž
<b>0</b> M58	i-Butanol	( 0.1	X
ON59	t-Butanol	( 0.1	ž
0P80	Total PCBs	( 10	ms/ks
9000	Carbon Tetrachloride	₹ 67	<b>a</b> d/1
0V22	Methylene Chloride	1700	<b>≥</b> ≤/}
<b>0V2</b> 5	Toluene	( 67	<b>a</b> 9/1
0V30	Trichlorofluoromethane	( 67	<b>m</b> \$/]
S015	X Ash at 550 C	< 0.1	<u>አ</u>
S040	British Thermal Units	HNC	
5064	Chlorine, Organic	⟨ 0.1	
S090	Flash Point (Pensky-Harten)	<b>&gt; 140</b>	F/
S098	Fluorine, Organic	( 0.01	χ
S1 <b>9</b> 5	% Water (Karl Fisher)	56	X .
5950	Acid Disestion		
<b>S971</b>	Ashind		
<b>S78</b> 0	Oxygen Bomb Preparation		
₩032	Ammonia - Distillation (as N)	⟨ 10	<b>a</b> 4/1
H050	BOD: 5-das (O2)	12000	m4/l
W116	Orsanic Carbon(non-murseable)	13500	<b>#</b> \$/1
H435	Nitrosen, Kjeldahl (N)	100	mg/1
H440	Nitrosen, Orsanic (N)	100	<b>m</b> 9/1
<b>N</b> 590	Solids, Bissolved at 180 C	5280	#4/1
W610	Solids: Suspended at 103 C	380	<b>m</b> \$/1





ATTENTION:

Laboratory Services Group 5350 Campbells Run Road Pittsburgh, PA 15205

REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

COMPOSITE OF DIRTY SOLVENT-SOUTH TANK

(UPPER LAYER)

#### LAB ANALYSIS REFORT

CLIENT NAME: PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

NR. DAVE MAZZOCCO

PA 15238

**REPORT DATE: 06/18/87** 

NUS CLIENT NO: 321909 NUS SAMPLE NO: 17041616 VENDOR NO:

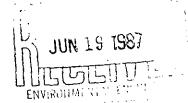
01831710 WORK DRDER NO: 55830

DATE RECEIVED: 04/28/87

SAMPLE IDENTIFICATION: CV-87-0182-03 UPPER LAYER

04/24

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	( 0.05	ms/1
H140	Chronium (Cr)	0.1	<b>a</b> s/1
M200	Lead (Pb)	( 0.3	md/l
M250	Mercury (Hs)	0.04	<b>1</b> 4/1
0F01	Xylenes	360000	mg/1(34%)
0F05	2-Butanone (MEK)	( 16000	mg/1
0F08	4-Methy1-2-Pentanone (MIBK)	120000	19/1(40)
0F99	Volatile Orsanic Scan		
01/32	Butal Cellosolve	3.8	X.
OM50	Petroleum nachtha	⟨ 1.0	7
8K57	n-Butanol	1.5	ï. %
0M58	i-Butanol	0.4	ž
0H59	t-Butanol	( 0.1	Ž
0N64	Hethyl Amyl Ketone	• (1	" X
8980	Total PCBs	( 10	ms/ks
8006	Carbon Tetrachloride	( 8000	<b>#</b> 9/]
0V22	Methylene Chloride	( 8000	#4/I
0V25	Toluene	88000	#\$/](8,890)
0030	Trichlorofluoromethane	( 8000	ms/1
<b>S015</b>	% Ash at 550 C	( 0.1	7
S040	British Thermal Units	16900	BTU/lb
S064	Chlorine, Orsanic	( 0.1	X
5090	Flash Point (Pensky-Marten)	( /= 70	F .
S098	Fluorine, Organic	0.02	ž
\$168	Specific Weight	6.9	Ĩb/gal
\$195	% Water (Karl Fisher)	0.2	7.
S210 -	Viscosity	5	CP CP
\$950	Acid Digestion		<b>-</b> .
S971	Ashins		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	8	ng/1 431
W435	Mitrosen, Kjeldahl (N)	22	mg/l 372731





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

COMPOSITE OF DIRTY SOLVENT-NORTH TANK (UPPER LAYER)

## LAB ANALYSIS REPORT

REPORT DATE: 06/18/87

ENVIRONMENTAL ENGINES

\* COSTOC: TUSE SOME

CLIENT NAME: PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

PA 15238

NUS CLIENT NO: NUS SAMPLE NO: 321909

VENDOR NO:

17041618 01831710

MORK ORDER NO: DATE RECEIVED:

UNITS

89/1 89/1 89/1 89/1 24°6

ms/1 ms/1 12%

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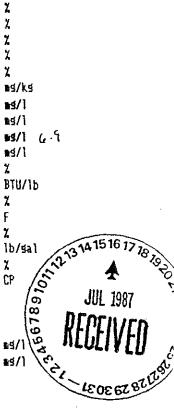
55830 04/28/87

ATTENTION: NR. DAVE NAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0183-03 UPPER LAYER

04/24

TEST	DETERMINATION	RESULTS
M050	Berallium (Be)	⟨ 0.05
W140	Chromium (Cr)	( 0.1
M200	Lead (Pb)	( 0.3
M250	Mercury (Hs)	0.008
OFO1	Xulenes	260000
0F05	2-Butanone (MEK)	( 8000
0F <b>0</b> 8	4-Heths1-2-Pentanone (MIBK)	130000
0F99	Volatile Organic Scan	
0H32	Butsl Cellosolve	4.2
OH50	Petroleum nachtha	⟨ 1.0
0H57	n-Butanol	1.5
0H58	i-Butanol	0.5
OK59	t-Butanol	( 0.1
OH64	Methyl Amyl Ketone	( 1.0
OP80	Total PCBs	( 10
DV06	Carbon Tetrachloride	<b>〈 4000</b>
<b>0</b> √22	Methylene Chloride	<b>4000</b>
0V25	Toluene	69000
0V30	Trichlorofluoromethane	( 4000
S015	X Ash at 550 C	( 0.1
S040	British Thermal Units	17100
S064	Chlorine, Organic	( 0.1
S090	Flash Point (Pensky-Marten)	( /= 70
<b>\$098</b>	Fluorine, Organic	( 0.01
\$168	Specific Weight	7.0
S195	% Water (Kar) Fisher)	0.6
<b>5210</b>	Viscosity	5
S950	Acid Disestion	
\$971	Ashing	
S980	Oxysen Bomb Preparation	
W032	Ammonia - Distillation (as N)	11
N435	Nitro≤en, Kjeldahl (N)	300







REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

FILTER CARTRIDGES

NON-LITHARGE

### LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.

> ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

PA 15238 NUS CLIENT NO: NUS SAMPLE NO: VENDOR NO:

321909 17041492

REPORT DATE: 06/04/87

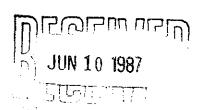
01831710 55830

ATTENTION: MR. DAVE MAZZOCCO

WORK ORDER NO: DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0175-03

TEST	DETERMINATION	RESULTS	UNITS
0143	TOTAL PCB'S IN SEDIMENT	<del></del>	
0£23	MLS Extraction		
0225 0781	Total PCBs - Soil	( 5	
0F01	Xylenes	· -	ms/ks
0F05	2-Butanone (MEK)	7100	ms/ks
0F08	4-Hethyl-2-Pentanone (MIBK)	( 200 2 <b>0</b> 0	<b>■</b> \$/k\$
0F99	Volatile Organic Scan	ZVV	<b>±</b> ⊈/kg
DM20	Ethal Acetate	1.8.4	
0M29	Ethanol	( 0.1 ( 0.1	X,
0H32	Butyl Cellosolve		X u
UMS4	Methyl Amyl Ketone	1.2	X.
0N19	·	( 0.1	χ
0V06	n-Propyl Acetate	( 0.1	X
	Carbon Tetrachloride	( 100	∎s/ks
0V22 0V25	Methylene Chloride	( 100	∎s/ks
	Toluene	620	ms/ks
0V30 S271	Trichlorofluoromethane	( 100	æs/ks
·	RCRA HETALS - SOLID		
\$400 \$410	Arsenic (As)	₹ 0.1	ms/ks
	Barium (Ba)	10	ms/ks
S420	Cadmiem (Cd)	( 0.5	≥s/ks
S430	Chromium (Cr)	1	<b>≥</b> ≤/k≤
\$450	Lead (Pb)	14	<b>a</b> s/ks
\$460	Mercury (Hs)	( 0.1	ms/ks
S490	Selenium (Se)	( 0.4	ms/ks
S500	Silver (As)	(1	<b>≥</b> s/ks
S950	Acid Digestion		
S010	Ammonia, Distillation (as N)	450	ms/ks
S015	% Ash at 550 C	2.9	X
S040	British Thermal Units	11900	BTU/1b
S064	Chlorine, Orsanic	( 0.1	7,
S090	Flash Point (Pensky-Marten)	) 140	F
<b>\$09</b> 8	Fluorine, Organic	( 0.01	X.



PAGE NO: 1



REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

(MICK) CATIONIC DISTILLATE

### LAB ANALYSIS REPORT

CLIENT NAME:

PPG INDUSTRIES, INC.

260 KAPPA DRIVE

PA

NUS CLIENT NO: NUS SAMPLE NO: VENDOR NO:

321909 17041490 01831710

PITTSBURGH,

15238

WORK ORDER NO:

55830

ATTENTION:

ADDRESS:

MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

DATE RECEIVED:

04/24/87

SAMPLE IDENTIFICATION: CV-87-0173-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	( 0.05	#4/l
H140	Chromium (Cr)	( 0.1	ms/)
M200	Lead (Pb)	( 0.3	<b>m</b> s/\
M250	Hercury (Hs)	( 0.004	<b>m</b> s/1
0F01	Xylenes	( 16000	æs/l
0F08	4-Methy1-2-Pentanone (MIBK)	740000	mg/1 7490
0F99	Volatile Organic Scan		
. 0110	Ethylbenzene	⟨ 0,1	X
0H32	Butyl Cellosolve	( 0.1	ÿ
0M57	n-Butanol	2.7	X
<b>0115</b> 8	i-Butanol	( 0.1	ž
01159	t-Butanol	⟨ 0.1	ž
0P80	Total PCBs	( 10	1 1 -
<b>8406</b>	Carbon Tetrachloride	( 16000	15/KS
0V22	Methylene Chloride	( 16000	<b>m</b> ⊴/l
9V25	Toluene	₹ 16000	ms/]
0V30	- Irichlorofluoromethane	( 16000	ms/l
S015	X Ash at 550 C	⟨ 0.1	ž
S0 <del>40</del>		15550	BTU/1b
S064	Chlorine, Organic	⟨ 0.1	X
S090	Flash Point (Pensky-Marten)	( /= 70	Ē
S098	Fluorine, Organic	( 0.01	X.
\$195	% Water (Karl Fisher)	1,2	ž
S950	Acid Digestion		••
S971	Ashins		
S980	Oxygen Bomb Preparation		
N032	Ammonia - Distillation (as N)	( 10	<b>e</b> s/]
₩050	BOD, 5-day (02)	> 180000	mg/]
W116	Orsanic Carbon(non-purseable)	INT	m 27
N435	Nitrosen, Kjeldahl (N)	44	<b>⊪</b> ⊴/1
H440	Nitrosen, Orsanic (N)	44	mg/l
W765	Total Sulfur (S)-gravimetric	400	mg/l

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS WERE DETECTED. INT FOR TOC DUE TO SAMPLE MATRIX INTERFERENCE.

Reviewed and Approved by: JMC

CLIENT ORIGINAL



Park West Two Cliff Mine Road Pittsburgh, PA 15275

REMIT TO:

412-788-1080

COMPOSITE OF SOLVENT STILL SLUDGE

### ANALYSIS REPORT LAB

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA BRIVE

ATTENTION: NR. BAVE MAZZOCCO

PITTSBURGH,

PA 15238

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909

NUS SAMPLE NO: 17041493 VENDOR NO: 01831710

WORK ORDER NO: 55830

DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

M050   Bersilium (Be)   (0.05   ms/1)	TEST	DETERMINATION	RESULTS	UNITS
M200	H050	Berallium (Be)	( 0.05	ms/1
M250   Mercurs (Hs)   0.12   ms/    OF01   Xylenes   330000   ms/    OF05   2-Butanone (MEK)   (16000   ms/    OF08   4-Methyl-2-Pentanone (MIBK)   34000   ms/    OF99   Volatile Orsanic Scan     OM10   Ethylbenzene   9.6   X     OM32   Butyl Cellosolve   (0.1   X     OM50   Petroleum naphtha   (1   X     OM57   n-Butanol   (0.1   X     OM58   i-Butanol   (0.1   X     OM59   t-Butanol   (0.1   X     OM59   t-Butanol   (0.1   X     OM64   Methyl Amyl Ketone   (0.1   X     OM64   Methyl Amyl Ketone   (0.1   X     OW66   Carbon Tetrachloride   (8000   ms/    OW22   Methylene Chloride   (8000   ms/    OW25   Toluene   35000   ms/    OW30   Trichlorofluoromethane   (8000   ms/    S015   X Ash at 550 C   (0.1   X     S040   British Thermal Units   16700   BTU/    S064   Chlorine, Orsanic   (0.1   X     S090   Flash Point (Pensky-Marten)   (70   F     S098   Fluorine, Orsanic   (0.01   X     S168   Specific Weisht   7.3   1b/sal     S195   X Mater (Karl Fisher)   0.06   X     S771   Ashins   S980   Oxysen Bomb Preparation	M140	Chronium (Cr)	⟨ 0.1	ms/1
OF01   X9lenes   330000   as/1	M200	Lead (Pb)	< 0.3	<b>≥</b> ≤/l
0F05         2-Butanone (MEK)         (16000 ms/l           0F08         4-Methyl-2-Pentanone (MIBK)         34000 ms/l           0F79         Volatile Ordanic Scan           0M10         Ethylbenzene         7.6 %           0M32         Butyl Cellosolve         (0.1 %           0M50         Petroleum naphtha         (1 %           0M57         n-Butanol         (0.1 %           0M58         i-Butanol         (0.1 %           0M59         t-Butanol         (0.1 %           0M64         Methyl Amyl Ketone         (0.1 %           0M64         Methyl Amyl Ketone         (10 ms/ks           0W06         Carbon Tetrachloride         (8000 ms/l           0W22         Methylene Chloride         (8000 ms/l           0W25         Toluene         35000 ms/l           0W25         Toluene         35000 ms/l           0W25         Toluene         35000 ms/l           S015         X Ash at 550 C         (0.1 %           S040         British Thermal Units         16700 BTU/lb           S064         Chlorine, Ordanic         (0.1 %           S098         Fluorine, Ordanic         (0.01 %           S168         Specific Meisht	M250	Hercury (Hs)	0.12	<b>a</b> d/]
OF08	DF01	Xulenes	330000	<b>a</b> g/1
OF99         Volatile Orsanic Scan           OM10         Ethylbenzene         9.6         X           OM32         Butyl Cellosolve         ( 0.1         X           OM50         Petroleum naphtha         ( 1         X           OM57         n-Butanol         ( 0.1         X           OM58         i-Butanol         ( 0.1         X           OM59         t-Butanol         ( 0.1         X           OM64         Methyl Amyl Ketone         ( 0.1         X           OP80         Total PCBs         ( 10         ms/ks           OV22         Hethylene Chloride         ( 8000         ms/l           OV25         Toluene         35000         ms/l           OV25         Toluene         35000         ms/l           OV25         Toluene         ( 8000         ms/l           OV25         Toluene         ( 8000         ms/l           OV25         Toluene         ( 8000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S064         Chlorine, Orsanic         ( 0.1         X	0F05	2-Butanone (MEK)	₹ 16000	<b>a</b> s/1
OM10         Ethylbenzene         9.6         X           OM32         Butyl Cellosolve         ( 0.1         X           OM50         Petroleum narhtha         ( 1         X           OM57         n-Butanol         ( 0.1         X           OM58         i-Butanol         ( 0.1         X           OM59         t-Butanol         ( 0.1         X           OM64         Methyl Amyl Ketone         ( 0.1         X           OP80         Total PCBs         ( 10         ms/ks           OUV06.         Carbon Tetrachloride         ( 8000         ms/l           OV22         Methylene Chloride         ( 8000         ms/l           OV25         Toluene         35000         ms/l           OV25         Toluene         35000         ms/l           OV25         Toluene         35000         ms/l           OV26         Trichlorofluoromethane         ( 8000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S064         Chlorine, Orsanic         ( 0.1         X           S070         Flash Point (Pensky-Hart	DF08	4-Methy1-2-Pentanone (MIBK)	34000	<b>n</b> g/1
OH32		Volatile Organic Scan		
6M59         t-Butanol         ( 0.1         X           0M64         Methyl Amyl Ketone         ( 0.1         X           0P80         Total PCBs         ( 10         ms/ks           0V06-         Carbon Tetrachloride         ( 8000         ms/l           0V22         Methylene Chloride         ( 8000         ms/l           0V30         Trichlorofluoromethane         ( 8000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S064         Chlorine, Orsanic         ( 0.1         X           S090         Flash Point (Pensky-Marten)         ( 70         F           S098         Fluorine, Orsanic         ( 0.01         X           S168         Specific Weisht         7.3         1b/sal           S195         X Water (Karl Fisher)         0.06         X           S210         Viscosity         10         CP           S950         Acid Disestion         S971         Ashins           S980         Oxysen Bomb Preparation	ON10	Ethylbenzene	9.6	X
6M59         t-Butanol         ( 0.1         X           0M64         Methyl Amyl Ketone         ( 0.1         X           0P80         Total PCBs         ( 10         ms/ks           0V06         Carbon Tetrachloride         ( 8000         ms/l           0V22         Methylene Chloride         ( 8000         ms/l           0V30         Toluene         35000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S044         Chlorine, Orsanic         ( 0.1         X           S090         Flash Point (Pensky-Marten)         ( 70         F           S098         Fluorine, Orsanic         ( 0.01         X           S168         Specific Heisht         7.3         1b/sal           S195         X Hater (Karl Fisher)         0.06         X           S210         Viscosity         10         CP           S950         Acid Bisestion         S971         Ashins           S980         Dxysen Bomb Preparation         Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Contact The Conta	0432	Butyl Cellosolve	⟨ 0.1	χ
6M59         t-Butanol         ( 0.1         X           0M64         Methyl Amyl Ketone         ( 0.1         X           0P80         Total PCBs         ( 10         ms/ks           0V06-         Carbon Tetrachloride         ( 8000         ms/l           0V22         Methylene Chloride         ( 8000         ms/l           0V30         Trichlorofluoromethane         ( 8000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S064         Chlorine, Orsanic         ( 0.1         X           S090         Flash Point (Pensky-Marten)         ( 70         F           S098         Fluorine, Orsanic         ( 0.01         X           S168         Specific Weisht         7.3         1b/sal           S195         X Water (Karl Fisher)         0.06         X           S210         Viscosity         10         CP           S950         Acid Disestion         S971         Ashins           S980         Oxysen Bomb Preparation	DM50	Petroleum narhtha	(1	X
6M59         t-Butanol         ( 0.1         X           0M64         Methyl Amyl Ketone         ( 0.1         X           0P80         Total PCBs         ( 10         ms/ks           0V06-         Carbon Tetrachloride         ( 8000         ms/l           0V22         Methylene Chloride         ( 8000         ms/l           0V30         Trichlorofluoromethane         ( 8000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S064         Chlorine, Orsanic         ( 0.1         X           S090         Flash Point (Pensky-Marten)         ( 70         F           S098         Fluorine, Orsanic         ( 0.01         X           S168         Specific Weisht         7.3         1b/sal           S195         X Water (Karl Fisher)         0.06         X           S210         Viscosity         10         CP           S950         Acid Disestion         S971         Ashins           S980         Oxysen Bomb Preparation	· · · · · · · · · · · · · · · · · · ·	n-Butanol		X
0M64         Methyl Amyl Ketone         ( 0.1	ON58	i-Butanol	⟨ 0.1	
OP80         Total PCBs         ( 10         ms/ks           OV06         Carbon Tetrachloride         ( 8000         ms/l           OV22         Methylene Chloride         ( 8000         ms/l           OV30         Trichlorofluoromethane         ( 8000         ms/l           S015         X Ash at 550 C         ( 0.1         X           S040         British Thermal Units         16700         BTU/lb           S064         Chlorine, Orsanic         ( 0.1         X           S090         Flash Point (Pensky-Harten)         ( 70         F           S098         Fluorine, Orsanic         ( 0.01         X           S168         Specific Weisht         7.3         1b/sal           S155         X Nater (Karl Fisher)         0.06         X           S210         Viscosity         10         CP           S950         Acid Bisestion         S971         Ashins           S980         Oxysen Bomb Preparation		t-Butanol		<b>X</b>
OV22		Methyl Amyl Ketone	( 0.1	X
OV22         Methylene Chloride         ( 8000 ms/l 35000				∎s/ks
OV25	OV06	Carbon Tetrachloride	( 8000	#4/1
0V30         Trichlorofluoromethane         ( 8000 ms/l           S015         X Ash at 550 C         ( 0.1 X           S040         British Thermal Units         16700 BTU/lb           S064         Chlorine; Orsanic         ( 0.1 X           S090         Flash Point (Pensky-Marten)         ( 70 F           S098         Fluorine; Orsanic         ( 0.01 X           S168         Specific Weisht         7.3 lb/sal           S195         X Nater (Karl Fisher)         0.06 X           S210         Viscosity         10 CP           S950         Acid Disestion           S971         Ashins           S980         Oxysen Bomb Preparation				<b>m</b> 9/1
S015		Toluene	35000	<b>m</b> 4/1
S040   British Thermal Units   16700   BTU/1b		Trichlorofluoromethane		<b>⊪</b> ⊴/1
S064   Chlorine, Orsanic   (0.1   X		X Ash at 550 C	( 0.1	X
S090   Flash Point (Pensky-Marten)   (70   F		British Thermal Units	16700	BTU/16
S098   Fluorine: Ordanic   ( 0.01   X		Chlorine, Organic	( 0.1	
S168 Specific Weisht 7.3 lb/sal S195 % Water (Karl Fisher) 0.06 % S210 Viscosity 10 CP S950 Acid Disestion S971 Ashins S980 Oxysen Bomb Preparation				
S195 % Hater (Karl Fisher) 0.06 % S210 Viscosity 10 CP S950 Acid Disestion S971 Ashins S980 Oxysen Bomb Preparation		Fluorine, Ordanic	( 0.01	Z
S210 Viscosity 10 CP S950 Acid Disestion S971 Ashins S980 Oxysen Bomb Preparation			7.3	lb/sal
S210 Viscosity 10 CP S950 Acid Disestion S971 Ashins S980 Oxysen Bomb Preparation	· ·	% Mater (Karl Fisher)	0.06	ኧ
S971 Ashins S980 Oxygen Bomb Preparation	S210		10	ርዮ
S980 Oxygen Boab Preparation		Acid Disestion		
MO32 Ammonia - Distillation (as N) 39 ms/1				
	H032	Ammonia - Distillation (as N)	. 39	mg/]

PAGE NO: 1

JUN 10 1987 CALLO DIEMENTAL ENGINETE : -



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Laboratory Services Group 5350 Campbells Run Road Pittsburgh, PA 15205

REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

COMPOSITE OF SOLVENT STILL SLUDGE

#### REPORT ANALYSIS LAE

CLIENT NAME: PPG INDUSTRIES, INC.

ADDRESS: 260 KAPPA DRIVE

PITTSBURGH,

ATTENTION: MR. DAVE MAZZOCCO

PA 15238

REPORT DATE: 06/04/87

NUS CLIENT NO: NUS SAMPLE NO:

321909

VEXDOR NO:

17041493 01831710

WORK ORDER NO:

55830

DATE RECEIVED:

04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
H435	Nitrosen, Kjeldahl (N)	540	m4/1
H440	Mitrosen, Orsanic (M)	500	as/1
H620	Solids, Total at 103 C	97900 (9.8	20 mg/1
W765	Total Sulfur (S)-gravimetric	680	<b>m</b> 5/1

TENTATIVELY IDENTIFIED COMPOUNDS	ESTIMATED RESULT (mg/L)	m 4 12
3-Methyl Hexane	5,300	CAK
Butyl Ester Acetic Acid	21,000	4/8/87
Unknown Alkane	35,000	

COMMENTS:

& CONTROL DEPARTMENT

Reviewed and Approved by: JMC

PAGE NO: 2





REMIT TO: Park West Two Cliff Mine Road Pittsburgh, PA 15275

412-788-1080

WASTE RESIN

13,000

#### ANALYSIS REPORT LAB

CLIENT NAME:

PPG INDUSTRIES, INC.

ADDRESS:

260 KAPPA DRIVE

PITTSBURGH,

PA 15238

REPORT DATE: 06/04/87

NUS SAMPLE NO:

321909 17041494

VENDOR NO:

NUS CLIENT NO:

01831710

ATTENTION:

MR. DAVE MAZZOCCO

WORK ORDER NO: DATE RECEIVED: 55830 04/24/87

SAMPLE IDENTIFICATION: CV-87-0181-03

TEST	DETERMINATION	RESULTS	UNITS	
H050	Beryllium (Be)	( 0.05	mg/l	
H140	Chromium (Cr)	( 0.1	#4/1	
<b>H200</b>	Lead (Pb)	< 0.3	mg/l	
M250	Mercury (Hs)	0.006	mg/l	
OF 99	Volatile Organic Scan			
0H32	Butyl Cellosolve	⟨ 0.1	χ.	
089D	Total PCBs	⟨ 10	ms/ks	
0906	Carbon Tetrachloride	( 8000	mg/1	
0V22	Methylene Chloride	⟨ 8000	ms/l	
0V25	Toluene	92000	m4/1	
0730	Trichlorofluoromethane	₹ 8000	<b>e</b> s/1	
5015	X Ash at 550 C	₹ 0.1	X	
S040	British Thermal Units	16000	BTU/1b	
S064	Chlorine, Orsanic	⟨ 0.1		
S090	Flash Point (Pensky-Marten)	( /= 65	F	
S098	Fluorine, Orsanic	( 0.01	. <b>%</b>	
S168	····Specific Weisht	7.4	lb/sal	
S195	% Water (Karl Fisher)	3.5	ኧ	
S210	Viscosity	10	CP	
\$950	Acid Digestion			
S971	Ashins			
\$980	Oxygen Bomb Preparation			
H032	Ammonia - Distillation (as N)	17	<b>≥</b> ≤/1	
W435	Nitrosen, Kieldahl (N)	370	æ4/1	
W440	Nitrosen; Orsanic (N)	350	ws/l	
W620	Solids, Total at 103 C	113000	mg/1	
W765	Total Sulfur (S)-gravimetric	420	as/l	
IDENTI	FIED COMPOUNDS	RESULT (mg/L)		
4-Methyl-2-Pentanone		42,000		
Ethylbe	enzene	59,000		
Total	Xylenes	230,000		
TENTAT	TVELY IDENTIFIED COMPOUNDS	ESTIMATED RESU	LT (mg/L)	ل عدر
COMMENTS: Hexane	,3-Methyl-	6,300		CAK
Acetic	Acid, Butyl Ester	13,000		4818

'Acetic Acid, Butyl Ester

48/87

## ATTACHMENT 5

on the second section of the second second

## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA FOINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9 ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA CIP D		HAV		CTD DELL	
DATA FIELD	MIN	MAX	HVG	BID DEA	
PER CENT TOT. SOLIDS					
PER CENT ASH	0.01	0.55	0.17	0.200	
PER CENT WATER	48.31	81.21	58.34	9.410	
ORGANIC HALOGEN %					•
ORGANIC NITROGEN %	0.14	0.99	0.48	0.280	
ORGANIC SULFUR %	0.01	0.46	0.11	0.130	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	0.00	2.20	0.63	0.730	
BERYLLIUM	0.00	0.00	0.00	0.000	
CADMIUM	0.00	1.10	0.37	0.337	
CHROMIUM	0.00	4.60	1.06	1.329	
LEAD	0.00	269.00	53.28	79.570	
MERCURY	0.00	0.00	0.00	0.000	
SELENIUM	0.00	0.00	0.00	0.000	
SILVER	0.00	3.50	1.00	1.344	
ALUMINUM		64.90	17.59	19.150	
DRGANIC CONSTITUENTS %					
MEK		2.00	0.97	0.620	
		0.10		0.031	
		9.40			
TOLUENE	0.00	0.30			
BUTYL ACETATE	0.00	0.70			
FIHAT BENZENE	0.00	0.50			
XYLENE		2.30			
BUTYL CELLOSOLVE		9.20			
CELLO. ACETATE		0.00			
DEG.METHYL ETHER		0.00			
HEXYL CELLOSOLVE		2.10			
		0.00			
DEG. BUTYL ETHER					
NAPHTHALENE					
MAK	0.00	0.10	0.01	0.031	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR		0.00	0.00	0.000	
ALKYL BENZENES	0.00	0.80	0.13	0.270	
ISOBUTANOL	0.00	0.10	0.01	0.031	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
FCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	2.80	0.31	0.880	
METHYLENE CHLORIDE		0.90	0.27	0.330	
TDI	0.00	0.00	0.00	0.000	

FAGE:

106

## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
( ALL ZERGES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	35	440	119	117.280	
TOT. SETT. SOLIDS	0.01	0.01	0.01	0.000	
HEATING VALUE	143	8864	5344	2862.490	
FLASH POINT	78.00	136.00	85.25	19.180	
WEIGHT/GALLON	8.18	8.78	8.41	0.200	
На	5.50	7.00	6.33	0.530	

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### MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102
DATES FOR MHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10 ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

( ALL ZERUES I	MDICHIES	NU DATA	WAS FUUND	FUR IMAL FIELD )	
DATA FIELD	MIN	MAX	AVG	STD DEV	
PER CENT TOT. SOLIDS	12.67	63.79	51.38	14.280	
PER CENT ASH	0.00	0.37		0.140	
PER CENT WATER	27.92	27.92	27.92	0.000	
ORGANIC HALOGEN %	0.00	0.19	0.07	0.050	
ORGANIC NITROGEN %	0.00	0.19			
ORGANIC SULFUR %	0.01	0.13	0.04		
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	0.00	4.60	1.91	1.660	
BERYLLIUM	0.00	0.00	0.00	0.000	
CADMIUM	0.10	1.40	0.52	0.387	
CHROMIUM	0.00	2.30	0.74	0.614	
LEAD	0.00	12.10	1.67	3.640	
MERCURY	0.00	0.00	0.00	0.000	
SELENIUM	0.00	0.00	0.00	0.000	
SILVER	0.00	2.10	0.61	0.730	
ALUMINUM	0.00	32.10	18.00	10.090	
ORGANIC CONSTITUENTS %					
MEK	0.00	22.20	3.70	8.270	
1-BUTANOL	0.00	0.00		0.000	
MIBK	0.00	2.00			
TOLUENE	0.00	0.20			
BUTYL ACETATE	0.00	0.40			
ETHYL BENZENE	0.00	0.90	0.15	0.335	
XYLENE	0.00	4.30	0.72	1.600	
BUTYL CELLOSOLVE	0.00	1.60	0.35	0.590	
CELLO. ACETATE	0.00	0.00	0.00		
DEG.METHYL ETHER	0.00	0.00	0.00		
HEXYL CELLOSOLVE		0.00	0.00		
ISOPHORONE	0.00	0.00	0.00		
DEG. BUTYL ETHER	0.00	0.40	0.08	0.146	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK -	0.00	0.00	0.00	0.000	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIFHATIC HYDROCAR		2.50	0.42	0.930	
ALKYL BENZENES	0.00	2.00	0.33	0.750	
ISOBUTANOL	0.00	0.40	0.07	0.149	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
FCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
METHYLENE CHLORIDE		0.00	0.00	0.000	
TDI	0.00	0.00	0.00	0.000	

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## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102 01/01/55 TO 12/31/90 DATES FOR WHICH THIS DATA WAS COMPILED: NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10 -( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	50	50	50	0.000	
TOT. SETT. SOLIDS	100.00	100.00	100.00	0.000	,
HEATING VALUE	10107	14556	13010	1649.260	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	8.69	8.69	8.69	0.000	
рН	6.00	6.00	6.00	0.000	

Compared to the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second

## MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

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DATA FIELD	MIN	MAX	AVG	STD DEV	
PER CENT TOT. SOLIDS	24.30	43.24	33.77	9.470	
PER CENT ASH	0.01	0.10	0.06	0.050	
PER CENT WATER	38.89	97.73	68.31	29.420	
ORGANIC HALOGEN %	000	0.01	0.01	0.010	
ORGANIC NITROGEN %	0.05	2.01	1.03	0.980	
	0.02				
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	2.70	6.40	4.55		
BERYLLIUM	0.00	0.00	0.00		
CADMIUM	1.00	1.20	1.10		
CHROMIUM	1.00	2.70	1.85	0.850	
LEAD	0.00	8.50	4.25		
MERCURY	0.00	0.00			
SELENIUM	0.00	0.00	0.00		
SILVER	0.00		0.00		
ALUMINUM		45.30	41.70		
ORGANIC CONSTITUENTS %		,	,,,,,,	0.000	
MEK		0.00	0.00	0.000	
1-BUTANOL	0.00	0.00			
MIBK	0.00	0.00	0.00	0.000	
TOLUENE	0.00	0.00			
FUTYL ACETATE	0.00	0.00	0.00		
ETHYL BENZENE	0.00	0.00	0.00	0.000	
XYLENE	0.00	0.00	0.00	0.000	
BUTYL CELLOSOLVE		0.00	0.00	0.000	
CELLO. ACETATE		0.00	0.00	0.000	
DEG.METHYL ETHER	0.00		0.00	0.000	
HEXYL CELLOSOLVE		0.00	0.00		
ISOPHORONE	0.00	0.00	0.00		
DEG. BUTYL ETHER		5.70	2.85	2.850	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK -	0.00	0.00	0.00	0.000	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR		0.00	0.00	0.000	
ALKYL BENZENES	0.00	0.00	0.00	0.000	
ISOBUTANOL	0.00	0.00	0.00	0.000	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
METHYLENE CHLORIDE		0.00	0.00	0.000	
TDI	0.00	0.00	0.00	0.000	
			or a tortor	22 8 2747474	

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#### MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA FOINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	210	1850	1030	820.000	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	200	8367	4284	4083.500	
FLASH POINT	78.00	78.00	78.00	0,000	
WEIGHT/GALLON	8.51	9.12	8.82	0.310	
рН	7.00	8.00	7.50	0.500	

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CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA_FIELD					
DHIH LICED	MIN	MAX	<u> AVG</u>	STD DEV	
PER CENT TOT. SOLIDS					
PER CENT ASH	0.14	19.46			
PER CENT WATER	1.13	1.13	1.13	0.000	
ORGANIC HALOGEN %	0.00	2.72	0.33	0.716	
	0.00	1.72	0.22	0.530	
ORGANIC SULFUR %	0.01	0.10		0.030	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	0.10	39.00	9.92	10.480	
BERYLLIUM	0.00	0.20		0.058	
CADMIUM	0.30	1.70	0.75	0.377	
CHROMIUM	0.00	7.50	2.69	2.681	
LEAD	0.00	80.10	9.41	21.060	
MERCURY	0.00	0.00	0.00	0.000	
SELENIUM	0.00	0.00	0.00	0.000	
SILVER	0.00	0.40	0.13	0.126	
ALUMINUM	11.60	2059.50	242.95	542.940	
ORGANIC CONSTITUENTS %	<u>.</u>				
MEK	0.00	30.90	3.12	9.260	
1-BUTANOL	0.00	1.00	0.11	0.298	
MIBK	0.00	11.10	1.27	3.310	
TOLUENE	0.00	3.70	0.47	1.117	
BUTYL ACETATE	0.00	4.80	0.61	1.449	·
ETHYL BENZENE	0.00	2.60	0.29	0.775	
XYLENE	0.00	12.80	1.44	3.820	
BUTYL CELLOSOLVE	0.00	4.80	0.59	1.440	
CELLO. ACETATE	0.00	0.00	0.00	0.000	
DEG.METHYL ETHER	0.00	0.00	0.00	0.000	
HEXYL CELLOSOLVE	0.00	34.70	3.47	10.410	
ISOPHORONE	0.00	0.00	0.00	0.000	
DEG. BUTYL ETHER	0.00	0.10	0.01	0.030	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK -	0.00	1.10	0.12	0.328	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAF	R 0.00	0.50	0.05	0.150	
ALKYL BENZENES	0.00	2.40	0.28	0.720	•
ISOBUTANOL	0.00	0.10	0.01	0.030	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
50536	0.00	0.00	0.00	0.000	
PCB'S					
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000	
		0.00 0.00	0.00 0.00	0.000	

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#### MAXMIN\_REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14

( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	145	1.45	145	0.000	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	3502	14883	9587	31 <b>55.5</b> 00	
FLASH FOINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	8.03	8.03	8.03	0.000	
pН	0.00	0.00	0.00	0.000	•

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODEF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: TO 12/31/90 11 ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

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DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV	
PER CENT TOT. SOLIDS	31.36	82.20	57.60	14.720	
PER CENT ASH	0.02	17.57	3.10		
PER CENT WATER	0.62	19.96	3.61	5.660	
ORGANIC HALOGEN %		0.38			
ORGANIC NITROGEN %	0.00	0.76	0.15	0.220	
ORGANIC SULFUR %	0.00	0.06			
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BAKIUM	0.10	16.40	4.38	5.640	
BERYLLIUM	0.00	0.00	0.00	0.000	
CADMIUM	0.30	1.20		0.301	
CHROMIUM	0.00	2.30	1.26	0.620	
LEAD	0.00	42.90	5.18	12.500	
MERCURY	0.00	0.00		0.000	
SELENIUM	0.00	0.00	0.00		
SILVER	0.00	6.60	1.23	2.254	
ALUMINUM	4.80	35.20	16.68	8.130	
ORGANIC CONSTITUENTS %					
MEK	0.00	3.50		1.000	
1-BUTANOL	0.00	6.60		2.279	
MIBK	0.00	9.20	•		
TOLUENE	0.00	9.50			
BUTYL ACETATE	0.00	1.90			
	0.00	6.10		2.125	
XYLENE	0.00	36.40			
BUTYL CELLOSOLVE	0.00	26.80		9.230	
CELLO. ACETATE	0.00	0.00		0.000	
DEG.METHYL ETHER	0.00	0.00			
HEXYL CELLOSOLVE		0.70			
I SOPHORONE	0.00	0.00			
DEG. BUTYL ETHER	0.00	1.30	0.16	0.372	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK "	0.00	0.70	0.13	0.226	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR		28.70	2.87	8.210	
ALKYL BENZENES	0.00	8.40	1.25	2.430	
ISOBUTANOL	0.00	0.10	0.01	0.029	
ETHYLENE GLYCOL	0.00	0.00	0.00	0,000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	1.30	0.12	0.374	
METHYLENE CHLORIDE		0.00	0.00	0.000	
TDI	0.00	0.00	0.00	0.000	

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#### MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101 01/01/90 TO 12/31/90 DATES FOR WHICH THIS DATA WAS COMPILED: NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	80	22580	3198	6596.150	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	7261	16314	14427	2455.720	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLÔN	7.55	8.81	8.17	0.340	
рH	0.00	0.00	0.00	0,000	

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CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102

DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90

NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9

( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

ALL ZENOES IN	D10016				
DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV	
PER CENT TOT. SOLIDS	24.34	77.33	41.93	15.480	
	0.04		0.06		
PER CENT WATER	0.34		1.07		
?					
ORGANIC HALOGEN.%	0.00	0.08	0.02	0.030	
ORGANIC NITROGEN %	0.03	1.73			
ORGANIC SULFUR %	0.00	0.06	0.03	0.020	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM		102.90	12.67		
BERYLLIUM	0.00	0.00	0.00		
CADMIUM	0.00	1.00	0.58		
CHROMIUM	0.00	13.20	2.36	3.888	
LEAD	0.00	0.70	0.10	0.220	
MERCURY	0.00	0.00	0.00	0.000	
SELENIUM	0.00	0.00	0.00		
SILVER	0.00	4.60	0.79	1.388	
ALUMINUM	3.60	40.20	18.80	11.920	•
ORGANIC CONSTITUENTS %					
MEK	0.00	0.40	0.14	0.140	
1-BUTANOL	0.00	4.30	1.23	1.576	
MIBK	0.60	17.80	7.66	5.550	
TOLUENE	0.00	60.10	8.10	18.410	
BUTYL ACETATE	0.00	46.50	8.97	14.620	
ETHYL BENZENE	0.00	4.30	1.19	1.301	
XYLENE	0.00	18.60	5.69	5.780	
BUTYL CELLOSOLVE			7.19	8.780	
CELLO. ACETATE	0.00	0.00	0.00	0.000	
	0.00	0.00	0.00	0.000	•
	0.00	0.00	0.00	0.000	
ISOFHORONE	0.00	0.00	0.00	0.000	
	0.00	26.70	2.97	8.391	
NAPHTHALENE	0.00	0.00	0.00	0.000	
MAK -	0.00	0.60	0.07	0.189	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	-0.00	0.00	0.00	0.000	
ALIFHATIC HYDROCAR	0.00	20.40	4.66	6.570	
ALKYL BENZENES	0.00	4.70	1.16	1,680	
ISOBUTANOL	0.00	0.10	0.02	0.042	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00	18.40	2.04	5.783	
METHYLENE CHLORIDE	0.00	0.70	0.08	0.220	
TDI	Q.QQ	0.00	0.00	0.000	

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	25	1870	734	403.830	
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000	
HEATING VALUE	13567	16633	15178	1139.170	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	7.21	9.00	8.07	0.540	
Ηα	0.00	0.00	0.00	0.000	

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CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101 01/01/90 TD 12/31/90 DATES FOR WHICH THIS DATA WAS COMPILED: NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6 . ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

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DATA FIELD	MIN	MAX	AVG	STD DEV	
PER CENT TOT. SOLIDS	10.86	49.89	21.17	13.440	
		13.78			
	7.22	90.26	37.68	31.470	
ORGANIC HALOGEN %	2.01	60.42	22.73	19.680	
ORGANIC NITROGEN %	0.01	0.37	0.12	0.130	
ORGANIC SULFUR %	0.02	0.38	0.09	0.130	
HEAVY METALS (ppm)					
ARSENIC	0.00	0.00	0.00	0.000	
BARIUM	0.60	211.70	38.60	77.540	
BERYLLIUM	0.00	0.00	0.00	0.000	
CADMIUM	0.30	1.80	0.93	0.502	
CHROMIUM		41.90			
LEAD		198.20			
MERCURY		0.00			
SELENIUM		0.00			
SILVER		0.10			
ALUMINUM	0.00	1058.30	225.60	380.070	
ORGANIC CONSTITUENTS %					
MEK		4.50			
1-BUTANOL		0.20			
MIBK	0.00				
TOLUENE	0.00	1.50			
BUTYL ACETATE	0.00				
ETHYL BENZENE			0.34		
XYLENE	0.00	4.80		1.640	
BUTYL CELLOSOLVE					
CELLO. ACETATE	0.00				
DEG.METHYL ETHER					
		0.00			
ISOPHORONE	0.00				
DEG. BUTYL ETHER				0.000	
NAPHTHALENE		0.00		0.000	
MAK -	0.00	0.50	0.10	0.200	
ETHYL ACETATE	0.00	0.00	0.00	0.000	
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000	
ALIPHATIC HYDROCAR	0.00	2.30	0.46	0.920	
ALKYL BENZENES	0.00	2.40	0.48	0.960	
ISOBUTANOL	0.00	0.10	0.02	0.040	
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000	
PCB'S	0.00	0.00	0.00	0.000	
ETHYL CELLOSOLVE	0.00 3.60	0.00	0.00	0.000	
METHYLENE CHLORIDE TDI	0.00	48.80	28.84	15.810	
1 D T	C - C/C/	0.00	0.00	0.000	

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#### MAXMIN\_REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	AVG	STD DEV	
PHYSICAL PROPERTIES	7 <b>5</b>	1105	70/	477 050	
VISCOSITY TOT. SETT. SOLIDS	35 2.00	1145 50.00	326 20.67	473.050 21.000	,
HEATING VALUE	1877	8108	5410	2207.580	
FLASH FOINT	78.00	110.00	86.00	13.860	
WEIGHT/GALLON	8.80	9.91	9.31	0.400	
рH	2.00	2.00	2.00	0.000	

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CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIFT SAMPLES) FOUND FOR THIS CODE: 45 · ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

				OK THAT FIELD )
DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	0.20	9.65	1.38	1.660
PER CENT ASH	0.00	0.59	0.13	0.190
PER CENT WATER	0.85	100.00	76.03	33 <b>.6</b> 70
ORGANIC HALOGEN %	0.00	0.04	0.01	0.010
ORGANIC NITROGEN %	0.00	1.31	0.14	
ORGANIC SULFUR %	0.00	0.08	0.02	
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	28.10	2.28	
BERYLLIUM	0.00	0.10	0.00	
CADMIUM	0.00	1.40	0.40	
CHROMIUM	0.00	7.80	0.93	
LEAD	0.00	15.30	0.84	
MERCURY	0.00	0.00	0.00	
SELENIUM	0.00	0.00	0.00	
SILVER	0.00	11.80		2.681
ALUMINUM	0.00	76.70	9.76	
ORGANIC CONSTITUENTS %				
MEK	0.00	8.50	0.55	1.840
1-BUTANOL	0.00	0.20	0.02	
MIBK	0.00	14.00	2.06	3.470
TOLUENE	0.00	26.60	2.24	
BUTYL ACETATE	0.00	1.80	0.17	
ETHYL BENZENE	0.00	9.80	1.58	2.903
XYLENE	0.00	44.30	6.20	11.330
BUTYL CELLOSOLVE	0.00	2.10	0.24	0.380
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
I SOPHORONE	0.00	0,00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.10	0.00	0.015
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK 🖟	0.00	0.10	0.00	0.015
ETHYL ACETATE	0.00	0.00	0.00	0,000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	10.50	0.59	2.110
ALKYL BENZENES	0.00	37.50	4.40	9.490
ISOBUTANOL	0.00	0.60	0.03	0.125
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
FCB1S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.20	0.00	0.029
METHYLENE CHLORIDE	0.00	0.40	0.03	0.090
ŦDI	0.00	0.00	0.00	0.000

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#### MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 45

( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	10	35	12	4,200	
TOT. SETT. SOLIDS	0.01	4.00	1.30	1.260	
HEATING VALUE	100	18421	4055	6601.770	
FLASH POINT.	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	6.86	8.45	8.16	0.320	
рН	2.00	9.00	3.00	1.710	

Julius Brancher Julie Brancher

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 55 · ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

		·		OK INHI PIELD )
DATA FIELD	MIN	MAX	<u>AVG</u>	STD DEV
PER CENT TOT. SOLIDS PER CENT ASH PER CENT WATER	10.99	66.33	36.34	11.820
PER CENT ASH	0.00	0.38	0.09	0.090
PER CENT WATER	0.00	30.23	6.41	6.700
ORGANIC HALOGEN %	0.01	0.88	0.22	0.200
ORGANIC NITROGEN %	0.00	2.28	0.39	0.450
ORGANIC SULFUR %	0.00	0.16	0.02	0.030
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	23.80	1.86	4.300
BERYLLIUM		0.10	0.00	0.013
	0.00	2.10	0.46	0.396
	0.00	4.00	0.48	0.734
LEAD	0.00	6.10	0.24	1.020
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	12.60 40.40	1.19	2.369
ALUMINUM	0.00	40.40	10.19	8.760
URGANIC CONSTITUENTS X				
MEK	0.00	3.50	1.43	0.950
1-BUTANOL	0.00	3.80	0.40	0 5A5
MIBK	2.00	43.70	13.25	7.640
TOLUENE	$\alpha = 0$	5.70	1 40	1 100
BUTYL ACETATE	0.10	4.50	2.57	1.079
ETHYL BENZENE	0.10	4.20	1.98	1 040
XYLENE	0.40	27.40	11.40	7.010
BUTYL CELLOSOLVE	2.40	23.10	9.59	4,570
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG METHYL ETHER		0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	2.00	0.35	0.555
ISOPHORONE	$Q \cdot QQ$	0.40	0.01	0.066
DEG. BUTYL ETHER	0.00	6.20	1.31	1.317
NAPHTHALENE	0.00	0.60	0.04	0.120
MAK -	0.00	4.10	0.86	0.750
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	7.00	1.88	2.140
ALKYL BENZENES	0.00	10.30	4.62	2.560
ISOBUTANOL	0.00	1.00	0.27	0.253
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	i.30	0.17	0.320
TDI	0.00	0.00	0.00	0.000

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#### MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101 DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90 NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: ( ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD )

DATA FIELD	MIN	<u>MAX</u>	AVG	STD DEV	
PHYSICAL PROPERTIES					
VISCOSITY	1	2470	218	388.310	
TOT. SETT. SOLIDS	0.01	17.00	6.34	7.580	
HEATING VALUE	10232	23335	14376	1968.230	
FLASH POINT	78.00	78.00	78.00	0.000	
WEIGHT/GALLON	7.30	9.15	8.20	0.380	
рН	0.00	0.00	0.00	0.000	

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ATTACHMENT 6

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ANALYSÍS KEPORT

PPG - Coatings & Resins RIDC Park 260 Kappa Drive Pittsburgh, PA 15238

Attention: Dave Mazzocco



## LANCY ENVIRONMENTAL SERVICES

DIVISION OF LANCY INTERNATIONAL, INC. An Alcoa Separations Technology Company

P.O. Box 419 Pittsburgh, PA 15230-0419 Phone (412) 772-0044 • FAX (412) 772-0055

Report Date 6/15/88 Sample Date\_ 6/2/88 Received\_ 6/3/88 by\_ FM Analyzed\_ 6/3 - 6/14/88 by\_ Staff No. of Samples\_ Purchase Order # Verbal

Analysis of Soil Samples	:	Project #20818 INCINERATOR ASH	PEFRACTORY BRICK
	CU-88-0155-06	CU-88-0156-06	CU-88-0157-06
Lab Reference #	<u>8060105</u>	<u>8060106</u>	<u>8060107</u>
	(mg/L)	(mg/L)	(mg/L)
TCLP ZHE Leachate			
Acetone	40. DE	40. OF	40. OF
	<0.05	<0.05	<0.05
n-butyl-alcohol	<5.0	<5.0	<5.0
Carbon disulfide	<1.05	<1.05	<1.05
Carbon tetrachloride	<0.05	<0.05	<0.05
Chlorobenzene	<0.15	<0.15	<0.15
2-methylphenol (o-cresol)	<2.82	<2.82	<2.82
3-methylphenol (m-cresol)	<2.82	<2.82	<2.82
4-methylphenol (p-cresol)	<2.82	<2.82	<2.82
Cresylic acid	<2.82	<2.82	<2.82
Cyclohexanone	<0.125	<0.125	<0.125
1,2-dichlorobenzene	<0.65	<0.65	<0.65
Ethyl acetate	<0.05	<0.05	<0.05
Ethyl benzene	<0.05	<0.05	<0.05
Ethyl ether	<0.05	<0.05	<0.05
Isobutnol	<5.0	<5 <b>.</b> 0'	<5.0
Methanol	<1.0	<1.0	<1.0
Methylene chloride	<0.20	<0.20	<0.20
Methylene chloride	<12.7	<12.7	<12.7
(from pharmaceutical industry)		•	
Methyl ethyl ketone	<0.05	<0.05	<0.05
Methyl isobutyl ketone	<0.05	<0.05	0.140
Nitrobenzene	<0.66	<0.66	<0.66
Pyridine	<1.12	<1.12	<1.12
Tetrachloroethylene	<0.079	<0.079	<0.079
Toluene	<1.12	<1.12	<1.12
1,1,1-trichloroethane	<1.05	<1.05	<1.05
1,1,2-trichloro-1,2,2-trifluoroethar	ne <1.05	<1.05	<1.05
Trichloroethylene	<0.062	<0.062	<0.062
Trichlorofluoromethane	<0.05	<0.05	<0.05
Xylene	<0.05	<0.05	<0.05
200		<del>-</del> - <del>-</del>	

C. John Ritzert, Manager-Technical Operations

## ANALYSIS REPORT

PPG - Coatings & Resins RIDC Park 260 Kappa Drive Pittsburgh, PA 15238

Attention: Dave Mazzocco

Analysis of Soil Samples

LANCY ENVIRONMENTAL SERVICES DIVISION OF LANCY INTERNATIONAL, INC. Ar. Alcoa Separations Technology Company

P.O. Box 419 Pittsburgh, PA 15230-0419

Phone (412) 772-0044 • FAX (412) 772-0055

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FM
Staff

Project #20818

	GI 00 01FF 06	JUNCINERATION ASH	REFRACTORY BY
Iab Reference #	CU-88-0155-06 8060105	∞-88-0156-06 8060106	CU-88-0157-06 8060107
IND RETERIOR #	<u>ευσυτου</u>	(mg/L)	(mg/L)
TCLP ZHE Leachate	(113/11)	(1113/12)	(11/3/10)
Chlorobenzene	<0.05	<0.05	<0.05
2-methylphenol (o-cresol)	<0.75	<0.75	<0.75
3-methylphenol (m-cresol)	<0.75	<0.75	<0.75
4-methylphenol (p-cresol)	<0.75	<0.75	<0.75
Cresylic acid	<0.75	<0.75	<0.75
1,2-dichlorobenzene	<0.125	<0.125	<0.125
Methanol	<1.0	<1.0	<1.0
Nitrobenzene	<0.125	<0.125	<0.125
Pyridine	<0.33	<0.33	<0.33
Tetrachloroethylene	<0.05	<0.05	<0.05
Toluene	<0.33	<0.33	<0.33
1,1,1-trichloroethane	<0.41	<0.41	<0.41
1,1,2-trichloro-1,2,2-trifluoroethan	ne <0.96	<0.96	<0.96

C. John Ritzert, Manager-Technical Operations

#### ATTACHMENT G

U.S. EPA Risk Assessment Forum
Dioxin and Furan Toxicity Equivalence Factor Tables

# Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs)

October 1986

Authors

Judith S. Bellin, Ph.D.

Office of Solid Waste and Emergency Response

Donald G. Barnes, Ph.D. Office of Pesticides and Toxic Substances

#### Technical Panel

Co-Chairmen: Donald G. Barnes (OPTS) Hugh L. Spitzer (ORD)

Steven Bayard, Ph.D. (ORD)
Irwin Baumel, Ph.D. (OPTS)
Judith Bellin, Ph.D. (OSWER)
David Cleverly, M.S. (OAQPS)
Frank Gostomski, Ph.D. (ODW/OWRS)
Charalingayya Hiremath, Ph.D. (ORD)

Paul Milvy, Ph.D. (OPPE) Abe Mittelman, M.S. (OSWER) Debdas Mukerjee, Ph.D. (ORD) Charles Nauman, Ph.D. (ORD) Jerry Stara, Ph.D., D.V.M. (ORD)

Risk Assessment Forum Staff
Dorothy E. Patton, Ph.D., J.D., Executive Director

Risk Assessment Forum
U.S. Environmental Protection Agency
Washington, DC 20460

Some Approaches to Estimating Relative Toxicities of PCDDs and PCDFs Table 1.

Basis/ compound	Swiss*	Grant <sup>a</sup> Olie <sup>c</sup> Commoner <sup>d</sup>	New York State*	Ontario f	FDA#	CA*	EPA <sup>†</sup> 1981	EPA current recommend
(Basis)	Enzyme		LD <sub>50</sub>	Various effects	Various effects			Various effects
Mono thru di CDOs Tri CDOs	0	0	0	0	0	0	0	0 0
777 6003	v	v	•	•	Ū	Ū	J	U
2378-TCDD	1	1	1	7	1	1	1	f
other TCDDs	0.01	1	O	0.01	O	Ö	1	0.01
2378-PeCDDs	0.1	0.1	1	1	0	1	0	0.5
other PeCDDs	0.1	0.1	0	0.01	0	0	0	0.005
2378-HxCDDs	0.1	0.1	0.03	1	0.02	1	0	0.04
other HxCDDs	0.1	0.1	0	0.01	0.02	0	0	0.0004
2378-HpCDDs	0.01	0.1	0	1	0.005	1	0	0.001
other HpCDDs	0.01	0.1	0	-0.01	0.005	0	0	0.00001
OCDD	0	0	0	0	< 0.00001	1	0	0
2378-TCDFs	0.1	0.1	0.33	0.02	o	1	0	0.1
other TCDFs	0.1	0,1	0	0.0002	Ö	0	Ö	0.001
2378-PeCDFs	0.1	0.1	0.33	. 0.02	0	1	0	0.1
other PeCDFs	0.1	0.1	0	0.0002	ο.	0	0	0.001

Table 1. (continued)

Basis/ compound	Swiss*	Grant <sup>a</sup> Olie <sup>e</sup> Commonar <sup>a</sup>	New York State*	Ontario f	FDA#	CA*	EPA <sup>1</sup> 1981	EPA current recommend
(Basis)	Епгуте	Enzyme	ιΩ₅o	Various effects	Various effects			Various effects
2378-HxCDFs other HxCDFs	0.1 0.1	0.1 0.1	0.01 0	0.02 0.0002	0	1	0	0.01 0.0001
2378-HpCDFs other HpCDFs	0.1 0	O. 1 O. 1	0	0.02 0.0002	0	10	0	0.001 0.00001
OCDF	0	0	0	0	о	0	0	0

<sup>\*</sup>Swiss Government, 1982. \*Grant, 1977. \*Olie et al., 1983.

Commoner et al., 1984.

<sup>\*</sup>Eadon et al., 1982. 'Ontario, 1982.

<sup>\*</sup>U.S. DHHS, 1983. \*Gravitz et al., 1983. \*U.S. EPA, 1981.

### ATTACHMENT H

Documentation of Partial Closure Activities in 1989

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REPORT OF CLOSURE
ACTIVITIES AND CERTIFICATION
OF CLOSURE FOR PPG'S
CIRCLEVILLE, OHIO, FACILITY

Submitted to:

PPG Industries, Inc. Circleville, Ohio

O.H. Materials Corp.

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Shirley McMaster, P.E. Senior Project Engineer

> November 17, 1989 Project 7137

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#### 1.0 INTRODUCTION

PPG Industries, Inc. (PPG) is undergoing closure of four RCRA hazardous waste management units. These units are:

- o Still Pad Drum Storage Area
- o South Pad Storage Area
- o West Drum Storage Area
- o Liquid Waste Incinerator Area

PPG is in the process of revising the closure plan for submittal to the Chio Environmental Protection Agency (Chio EPA) for final approval.

At PFG's discretion, certain closure activities have taken place prior to the final submittal and subsequent approval of the closure plan. PPG has kept the Ohio EPA advised as to when the closure activities would take place; also, all of Ohio EPA's comments on the closure plan made during the appeal process were taken into account during closure activities. These closure activities have been completed.

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#### 2.0 SCOPE OF WORK

OHM was contracted to perform the following tasks:

- o Still Pad Drum Storage Area
  - Wash and rinse the bad
  - Collect and drum the rinsewater
  - Sample and analyze the final rinsate
  - Sample and analyze sediment in two grated cover manholes
  - Provide the professional engineer's Closure Certification
- o South Pad and West Drum Storage Areas
  - Sample and analyze area soils
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification
- o Liquid Waste Incinerator Area
  - Dismantle the incinerator
  - Sample and analyze area soils
- Sample and analyze the rinsates from flushing the organic waste and aqueous waste feed lines
  - Remove all concrete pads

- Provide the professional engineer's Closure Certification

#### 3.0 METHODS

The following sections describe closure activities and analytical methods.

#### 3.1 STILL PAD DRUM STORAGE AREA

The Still Pad Area was an uncurbed concrete pad approximately 80 feet by 100 feet. There were two grated sewer inlets and two sealed sewer manholes located within the pad area.

OHM operations personnel and the professional engineer mobilized to the site on April 17, 1989. There were no drums on the pad. PFG had previously scarified the top 1/4-inch of the pad. This material was placed into 55-gallon drums and disposed of in Chemical Waste Management of Indiana's TSD. facility in Fort Wayne, Indiana (ADAMS CENTER).

OHM installed temporary foam curbing around the pad perimeter and the four sewer inlets. The pad was washed twice with an industrial cleaner and rinsed three times with high pressure water lasers. The rinsewater was collected with wet/dry vacuums and placed in drums. Each of the three rinses were placed in separate drums.

At the completion of the third rinse, the foam was removed and placed in separate drums. In all, 15 drums of liquids and solids were generated:

- o First rinse--three drums
- o Second rinse--four drums
- o Third rinse--three drums
- o Foam dike--four drums
- o Trash, protective clothing--one drum

Samples of the three drums of the third rinse were obtained for analyses. A separate 4 foot long dip tube was used for each drum to ensure sampling of the entire drum contents. Each sample container was filled with equal volumes from each drum.

A sample was also obtained from the plant water used as the rinsewater source. The sample was taken from a tap in the Still House.

OHM also obtained sediment grab samples from the bottom of the two grated cover manholes.

Clean glass containers with Teflon-lined lids were used for all samples. Chain-of-custody forms accompanied all samples.

All 15 drums of rinsate and debris were incinerated on site at the hazardous-waste incinerator.

#### 3.2 SOUTH PAD STORAGE AREA

The South Pad is a gravel area, approximately 90 feet by 240 feet. There is a curbed concrete pad, approximately 15 feet by 45 feet located on the south side of the area.

OHM sampling personnel mobilized to the site on July 17, 1989, to perform soil sampling on the South Pad Storage Area, the West Drum Storage Area, and the Liquid Waste Incinerator Area.

Using a grid established by PPG, and the edge of an existing concrete pad as the western boundary of the South Pad, CHM located the sample points. A sample was taken from the center of each box shown as shaded on Figure 3.1.

A power auger was used to remove the top 4 to 6 inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The power auger bit was decontaminated using a soap and water wash and distilled water rinse between each location.

The sample gloves and tongue depressors were discarded after each location. All samples were labeled and transferred to the laboratory in coolers. Chain-of-custody forms accompanied all samples.

The holes were backfilled after the sample had been obtained. The decontamination water was placed in one drum, and trash and debris placed in another drum.

On November 7, 1989, the concrete containment pad was broken up, removed, and transported to ADAMS CENTER.

#### 3.3 WEST DRUM STORAGE AREA

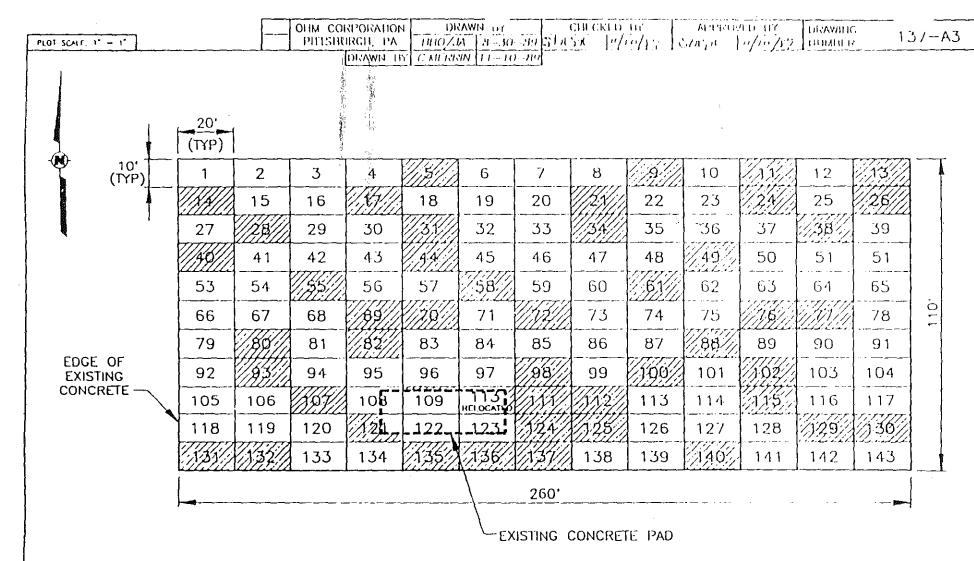
The West Drum Storage Area is a gravel area, approximately 10 feet by 100 feet.

Using a grid supplied by PPG and an existing monitoring well as the northwest corner of the area, OHM located the sample points. These points are shown in Figure 3.2.

The samples were obtained in a fashion similar to that described in Section 3.2 for the South Pad Storage Area.

#### 3.4 LIQUID WASTE INCINERATOR AREA

The liquid waste incinerator has been taken out of service.



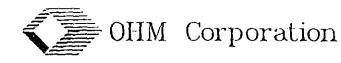
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FIGURE 3.1

SOUTH PAD SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES CIRCLEVILLE, OHIO



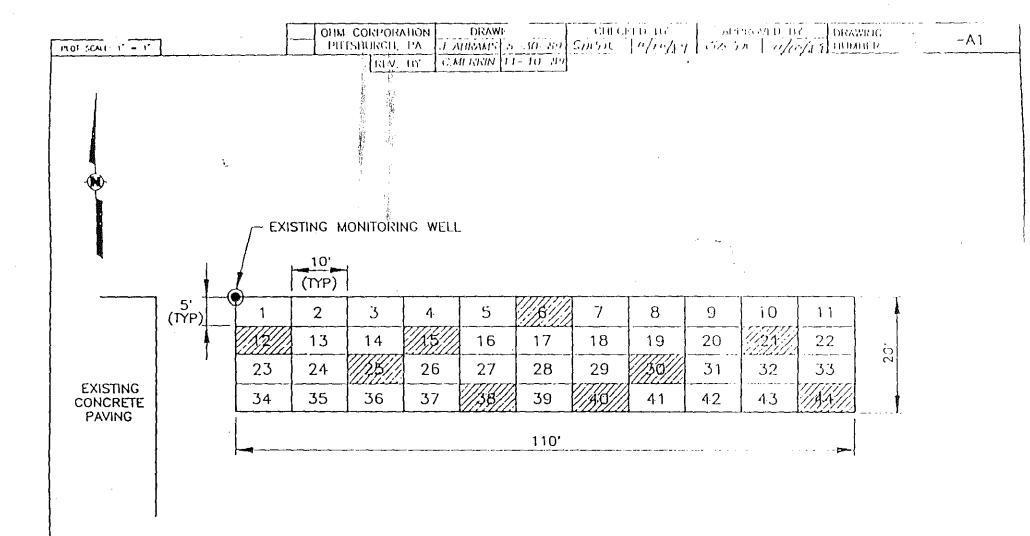
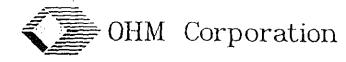


FIGURE 3.2

WEST PAD SAMPLE LOCATION MAP

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PPG INDUSTRIES CIRCLEVILLE, OHIO



On June 5, 6, and 7, 1989, OHM dismantled the incinerator hearth, breech, and stack, and loaded them into trucks for transport to ADAMS CENTER.

#### 3.4.1 Soil Sampling

An area surrounding the incinerator pad was selected for soil sampling. The incinerator occupied a concrete pad approximately 10 feet by 40 feet along with a 20 foot square concrete containment area. The area to be sampled was 90 feet by 110 feet.

Using PPG's sampling grid, OHM located the sample points shown on Figure 3.3. The northwest corner of the area was selected 23 feet north and 29 feet west of the corner of the incinerator pad. Three samples were relocated in the field: Location 9 was moved south and east to avoid an existing equipment pad; Location 48 was moved east off the incinerator pad; Location 78 was moved east outside an electrical substation.

All soil sampling activities were similar to those described in Section 3.2, South Pad Storage Area.

#### 3.4.2 Line Flushing

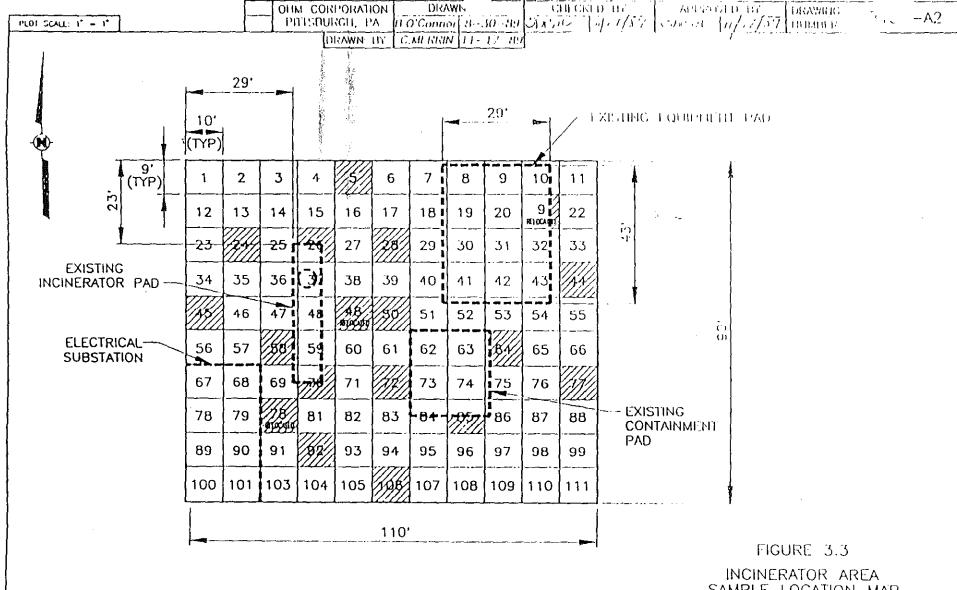
There were three pipelines at the Liquid Waste Incinerator that carried hazardous materials. Two of the lines were designated as organic waste feed lines and the other as an aqueous waste feed line. The lines were flushed and drained when the incinerator was taken down. The lines were to be flushed again as part of the closure activities.

OHM's professional engineer was on site on August 24, 1989, to witness the flushing and obtain rinsate samples.

The two organic feed lines were flushed first. A recycle line on the pipe rack was used to recirculate the solvent solution. For each organic line, solvent was circulated at least three times and then sent to PPG's on-site hazardous-waste incineration facility.

Following the solvent flushing, service water was used for the final flushing. Three rinses with clean water were performed. Each rinse was segregated in a separate drum and sent to the on-site incinerator.

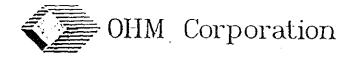
The aqueous waste line was flushed three times with deionized water. Each rinse was segregated in a separate drum and incinerated on site.



SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES CIRCLEVILLE, OHIO



The three final rinsewaters were sampled. Four-foot long dip tubes were used to ensure a representative sample was obtained from each drum. Samples were also taken from the hose used to supply the service water and a drum of the clean deionized water. The samples were placed in clean glass jars with Teflon-lined lids. Clean dip tubes and sample gloves were used to take each sample. The containers were held in coolers during transport to the laboratory. Chain-of-custody forms accompanied all samples.

#### 3.4.3. Concrete Removal

On November 7 and 3, 1989, CHM removed the concrete incinerator pad and containment. The footings for the incinerator pad were removed to a few inches below grade. The concrete was transported to ADAMS CENTER.

#### 3.5 ANALYTICAL METHODS

All the samples obtained (soils, rinsates, and source waters) were analyzed for F003 and F005 solvents using the following methods:

- o Alcohols--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 2nd edition, July 1982; Method 5030, Purge and Trap, and Method 8015, Nonhalogenated Volatile Organics.
- O Volatile Priority Pollutants--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition, September 1986; Method 8240, GC/MS Method for Volatile Organics.

The final rinsate at the Still Pad Storage Area was also analyzed for methylene chloride and acrylonitrile by the above methods and for PCBs by the following method:

o PCBs--The water sample was prepared and analyzed according to USEPA Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, July 1982; Method 608, Pesticides and PCBs.

The soil samples at the South Pad Storage Area, West Drum Storage Area, and the incinerator area were composited and analyzed for PCBs according to the following method:

o USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 2nd edition, July 1982; Method 3550, Sonication or Method 3540, Soxhlet Extraction and Method 8080, Organochlorine Pesticides and PCBs. The samples at the South Pad were composited into two samples—one encompassing samples S-131, 003 through 14, and 016 through 026; the other samples 027 through 032, and 034 through 051. The 18 nonduplicate samples at the West Drum Storage Area were composited into one sample and the nine non-duplicate samples at the incinerator area were composited into one sample.

The composite soil sample from the incinerator area was analyzed for the following:

Polychlorinated Dibenzo-P-Dioxins and Furans, namely 2,3,7,8-TCDD and 2,3,7,8-TCDF--Sample was prepared and analyzed according to USEPA Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition, November 1986; Method 8280, GC/MS Method for Polychlorinated Dibenzo-P-Dioxins and Furans.

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#### 4.0 RESULTS

The following paragraphs discuss the results of the closure activities.

#### 4.1 STILL PAD DRUM STORAGE PAD

Of the F003 and F005 solvents analyzed, none were detected in the still pad final rinsate sample. There were no PCBs, acrylonitrile, or toluene disocyanate detected in the final rinsate. Methylene chloride was detected at 169 parts per billion (ppb).

The rimsate was sent to PPG's Circleville incineration facility. The concrete pad was demolished and sent to ADAMS CENTER. The drums of debris from the scarification of the pad were also sent to ADAMS CENTER.

#### 4.2 SOUTH PAD STORAGE AREA

The results of the F003 and F005 analyses on the 50 soil samples have been summarized in Table 4.1. Only those 16 sample points which had detectable concentrations are shown in the table. One composite sample had 0.334 ppm PCBs, the other 3.56 ppm PCBs. These soils will be addressed at a future time.

#### 4.3 WEST DRUM STORAGE AREA

A total of 10 samples were taken at the West Drum Storage Area. The F003 and F005 solvent concentrations have been summarized in Table 4.2. There were only four locations which had detectable concentrations. There were no PCBs detected in the composite sample. The soils in these areas will be addressed at a future time.

# 4.4 LIQUID WASTE INCINERATOR AREA

There were 19 soil samples taken at the incinerator area. Detectable F003 and F005 concentrations have been summarized in Table 4.3. Only nine locations were above detection limits. There was 1.79 ppm PCBs detected in the composite sample. There was 0.15 ppb of 2,3,7,8-TCDF present in the composite sample while the 2,3,7,8-TCDD was below detectable limits. The soils at these locations will be addressed at a future time.

The rinsate sample analyses for the aqueous waste and organic waste feed lines are summarized in Table 4.4. Detectable concentrations of several F003 and F005 solvents were present in all three final rinsates. The pipe was dismantled; no solids or residue were visible in the pipes. The pipes were sent to ADAMS CENTER for disposal.

TABLE 4.1

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - SOUTH PAD STORAGE AREA

Compounds Detected (ppm)

Sample Number	Location	Toluene	Total Xylenes	Ethylbenzene
S-131	S-131	2	BDL	BDL
CC4	S-135	3DL	0.11	BDL
905	S-136	0.8	BDL	BDL
010	S-125	0.4	BDL	BDL
.013	S-107	0.4	BDL	BDL
015	S-109	BDL	0.6	BDL
018	S-112	0.4	BDL	BDL
021	S-100	21	8	2
024	S-80	0.5	BDL	BDL
025	5-83	2	BDL	BDL
028	S-76	17	BDL	0.3
029	5-72	BDL	BDL	0.4
031	S-69	1	1.8	0.3
034	S-58	0.3	BDL	BDL
035	S-61	0.3	BDL	BDL
038	S-40	0.4	BDL	BDL
Detection Limit	N/A	0.3	0.3	0.3

BDL = Below Detection Limit

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TABLE 4.2

# F003 AND F005 SOLVENTS ANALYTICAL SUMMARY SOILS - WEST PAD STORAGE AREA

Compounds Detected (ppm)

Sample Number	Location	Methanol	Toluene	Ethylbenzene	n+p-Xylene	o-Xylene
053	7-44	0.988	1.34	BDL	BDL	BDL
057	W-06	BDL	BDL	0.229	1.14	1.02
053	W-38	BDL	0.621	BDL	BDL	BDL
061	W-12	BDL	BDL	BDL	0.225	0.229
Detection Limit	n N/A	.968	.19	.19	.19	. 19

EDL = Below Detection Limit

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TABLE 4.3

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - INCINERATOR AREA

Compounds Detected (ppm)

Sample Number	Location	Ethylbenzene	Total Xylenes
066	I - 64	0.3	0.9
0.57	ı I-85	0.6	0.7
070	r – 72	BDL	1.7
072	I-70	BDL	BDL
077	I - 2 4	2 .	4
078	I-28	BDL	BDL
079	I-48	BDL	0.4
080	I – 45	0.6	2
081	I-50	BDL	BDL
Detection Limit	N/A	0.3	0.3

BDL = Below Detection Limit

TABLE 4.4

# F003 AND F005 SOLVENTS ANALYTICAL SUMMARY LIQUIDS - INCINERATOR AREA

#### Concentration (ppm)

Item	Methanol	Isobutanol	Butanol	Ethyl- benzene	Toluene	Total Xylenes
Organic Waste Line 1	16.5	1.71	18.9	24	33	180
Organic Waste Line 2	93.1	10.1	85.3	36	75	240
Aqueous Waste	BDL	BDL	BDL	9.9	15	31
Service Water	BDL	BDL	BDL	BDL	BDL	BDL
Deionized Water	BDL	BDL	BDL	BDL	.17*	BDL
Detection Limit	1.0	1.0	1.0	0.5	0.5	0.5 .

<sup>\*</sup>Detection Limit - 5 parts per billion

#### 5.0 CONCLUSIONS

The closure activities completed to date have been consistent with the specifications set forth in Ohio Administrative Code 3745-66-12 and the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988.

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